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BRITISH MEDICAL JOURNAL

LONDON SATURDAY NOVEMBER 13 1954

HUNTINGTON'S CHOREA IN NORTHAMPTONSHIRE

BY

M. J. PLEYDELL, *M.C.*, M.D., B.S., D.P.H.

Deputy County Medical Officer of Health, Northamptonshire

Huntington's chorea is a fatal hereditary disease which is due to a dominant gene. The average age of onset is 35.5 years and the average duration of the disorder 13.7 years (Bell, 1934), but wide variations occur in both these factors. The involuntary athetoid movements are considered to be associated with the atrophy of the ganglion cells of the caudate nucleus and putamen; the mental deterioration with atrophy of the cerebral cortex; and rigidity, when it is present, with involvement of the large cells of the globus pallidus.

Although Huntington's chorea is described as a rare disease, it is probable that systematic search and accurate recording would reveal the incidence to be higher than is generally supposed. No attempt appears to have been made to obtain a true assessment of the number of cases in this country, and it was felt that a central Midland county such as Northamptonshire with a population of approximately 263,000 might provide an indication of the incidence of the disease. It was decided, therefore, to ascertain the number of cases in the county, and for this purpose the following procedure was adopted. (1) A questionary was sent to the senior partner of every practice in Northamptonshire asking whether or not there was a case of Huntington's chorea in the practice. The information thus obtained from each practice denoted the existence of six choreic families. (2) With the consent of the medical superintendent of the mental hospital which serves the town and county of Northampton, the records of two certified patients who were admitted from the county area were made available and their pedigrees traced back from information provided by relatives.

Inquiries of this nature can be undertaken only by medical observers, and this illustrates the value of medical rather than lay administration in a health service. The results of the survey indicated the existence of eight choreic families in the county; in one of these families the disease appears to have died out, but, as is frequently the case, marriages have been broken and relatives have separated, so that a complete history could not be obtained. Sixty-one cases of the disease were revealed by tracing back the pedigrees, and 13 patients are at present alive in the county. The details of the family histories are as follows.

Pedigree One (Fig. 1)

I 1:—Died in the Northamptonshire asylum; the cause of his insanity is not recorded.

II 1 (1834–87):—Suffered from Huntington's chorea and died in the asylum at the age of 53.

III 1:—Age of onset of disease not known; death aged 48 in the mental hospital. III 2:—Onset aged 40; death aged 48 in the mental hospital. III 3:—Onset aged 38; death aged 45. III 4:—Onset aged 40; death aged 57 in the mental hospital. He suffered also from pulmonary tuberculosis. III 5:—Onset aged 42; mania as well as chorea present; death aged 52. III 6, III 7, and III 8 did not inherit the disease, and no information is obtainable about the descendants of III 6 and III 7. III 9:—Onset aged 40, death aged 50. His wife committed suicide when she realized she had passed the disease on to her youngest child.

IV 1:—Onset aged 40; died aged 50 in the Poor Law Hospital. IV 2:—Onset aged 40; died aged 53 in the Poor Law Hospital. IV 4:—Onset aged 40; unable to concentrate or carry out simple functions; mental deterioration; speech indistinct; gait unsteady. Admitted to a mental hospital and diagnosed as Huntington's chorea. Died aged 53. IV 5:—Aged 46; onset aged 35 with involuntary movements of limbs and trunk; hesitant speech; her face is expressionless. Her gait is unsteady and she is unable to stand still; there is slight spasticity, and mental deterioration is present; she is unemployable. IV 6:—Aged 42; onset aged 34. Speech affected first, and at present his speech is of an explosive character; his face is expressionless. He has a festinating gait and there is spasticity of the limbs; mental deterioration is present and he quickly loses his temper; he is unemployable. IV 9:—Onset of disease aged 40 with characteristic involuntary movements. Died at 51. IV 11 was aware of the hereditary nature of the disease. He enlisted in the first world war, caring little whether he was killed or not. He was decorated twice, and after the war he married, but deliberately abstained from having children. IV 12:—Onset of disease aged 43 with difficult, slurred speech; later involuntary movements. Death aged 54. IV 13:—Onset aged 27, with difficulty in speech, followed by choreiform movements. Death aged 30 as a result of an accident. IV 14:—Onset at 27 with dyslalia; died aged 34. Her baby died a day after birth. IV 16:—Like his brother, IV 11, he was well aware of the hereditary nature of the disease. He also enlisted in the first world war with little regard whether he was killed or not, and was decorated three times. The onset of the disease was first noticed with choreiform movements at the age of 28 after demobilization, and he died aged 35. IV 20:—Onset aged 39 with involuntary movements and facial grimaces; slight spasticity present. There is mental deterioration, and she appears to be feeble-minded; she is unemployable. Present age, 42 years. IV 22:—Onset aged 18 with choreiform movements; died aged 26.

V 1–V 6:—No detailed information is available regarding this branch of the family, but the history that was obtained did not indicate that any member was suffering from Huntington's chorea. V 10:—Suffered from a nervous breakdown two years ago and was treated as an out-patient in the mental hospital. V 14:—Age of onset 18 years, while

she was in the A.T.S., with involuntary choreiform movements; mental deterioration. Admitted to a mental hospital in Northamptonshire, where a diagnosis of Huntington's chorea was made; later transferred to a mental hospital in Surrey. V 16:—Onset aged 19; now aged 26. He received a normal education and was employed before the war; he was accepted into the Army, but later was invalided out. Since his discharge from the Army he has not been employed. He has appeared before a magistrate's court on minor charges and for the past five years has been content to remain without any work in Part III accommodation. Here his mental deterioration became more and more marked, until at last his unkempt appearance and his curiosity in the opposite sex necessitated his removal to a mental hospital.

In 1953 his mental age assessed on the Stanford Binet intelligence scale Form L was 10 years 7 months and his intelligence quotient 71. Later he was examined with the Wechsler–Bellevue intelligence scale Form I, and on this he obtained an intelligence quotient of 95 on the verbal scale, 69 on the performance scale, and 82 on the full scale. Slight choreiform movements have developed over the past year, affecting the trunk and extremities. He repeats himself continuously, is unable to carry on a conversation, and, apart from occasional grimaces, his face is expressionless.

Nevertheless, despite the fact that both in his social and in his intellectual capacity he was a mental defective, he could not be dealt with as such on account of the age stipulation in the definition, which requires that the defectiveness shall be present before the age of 18 years. This definition, although introduced in order to deal with persons suffering from post-encephalitic defectiveness, associates disease with a sudden chronological event rather than a gradual pathological process, and for this reason is unsatisfactory.

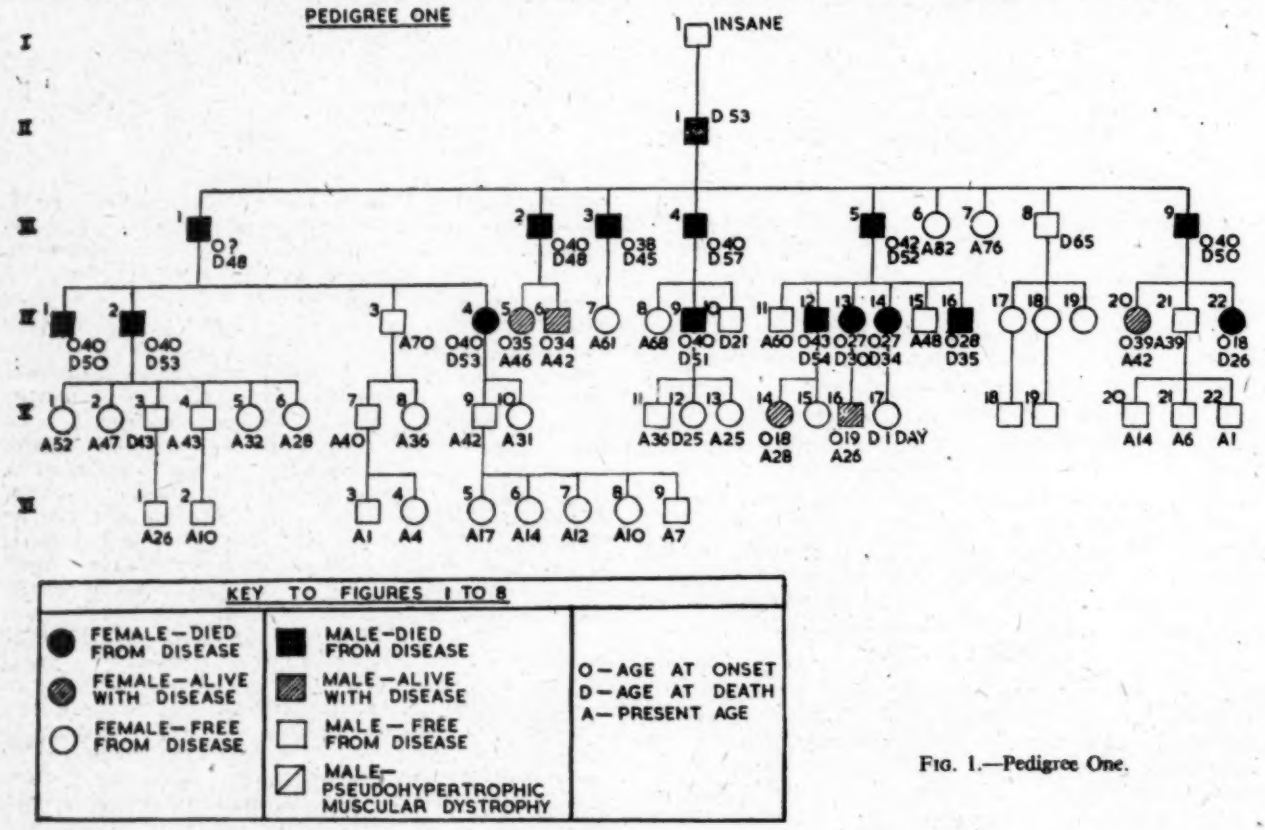

FIG. 1.—Pedigree One.

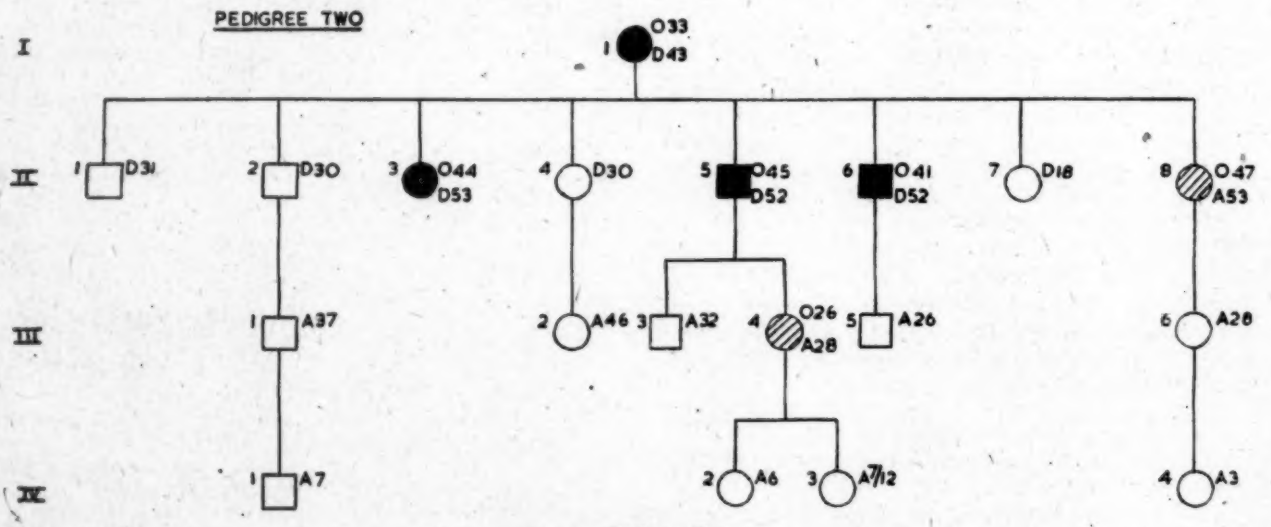

FIG. 2.—Pedigree Two.

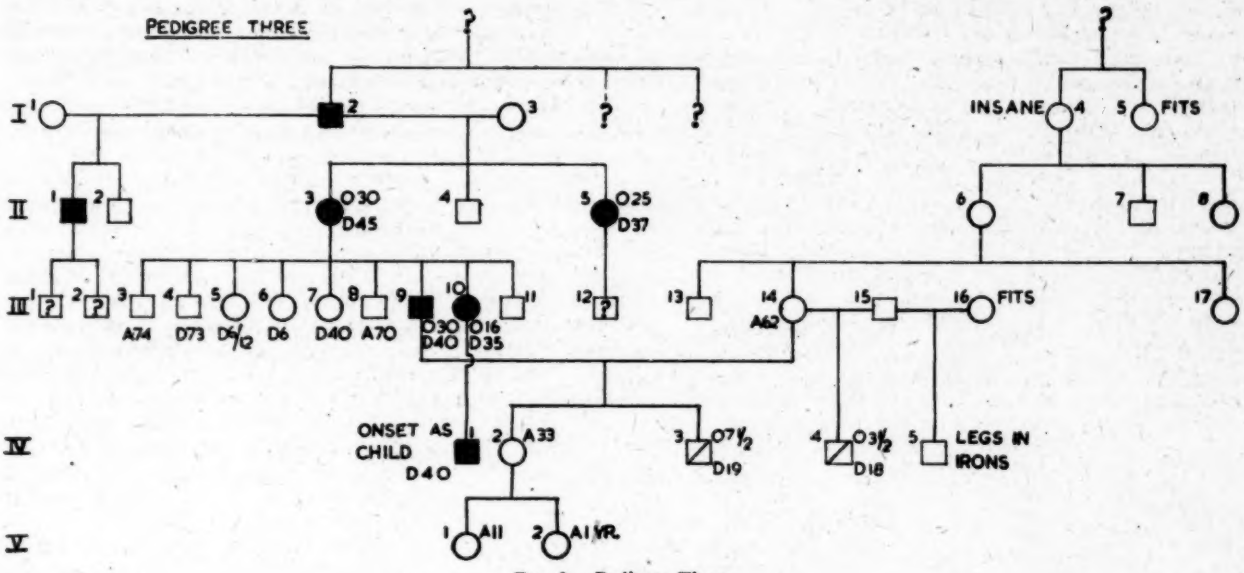

FIG. 3.—Pedigree Three.

Davenport stated that the way in which the disease affected a family might well be characteristic and that the symptoms could breed true in that family. This observation is supported by the information obtained in the present survey. Thus difficulty in speech was frequently the first sign of the disease amongst afflicted members of the family in this pedigree. In all the other families dyslalia occurred late, and Bell remarks on its rarity in the early stages as characteristic of the disease.

Pedigree Two (Fig. 2)

I 1:—Came to the county from Derbyshire; onset of disease at 33; death at 43.

II 1 was killed in the first world war aged 31. II 2 was killed in the first world war aged 30. II 3:—Onset of disease, aged 44; admitted to County Mental Hospital; died aged 53. II 4:—Died from influenza in 1919 aged 30. II 5:—Onset of disease aged 45; admitted to County Mental Hospital; died aged 52. II 6:—Onset aged 41; admitted to County Mental Hospital; died aged 52. II 7:—Died suddenly of heart trouble aged 18. II 8:—Onset of disease aged 47; first noticed when she started dropping things; later developed jerky movements of arms and legs, followed by facial grimaces; mental deterioration only slight. On examination she is unable to remain still; gross movements of limbs and trunk; involuntary grunting noises. Her face is expressionless. Present age 53.

III 3:—No signs of disease; has received hormone therapy on account of infertility. III 4:—Onset of disease aged 26; present age, 28. Physical characteristics: coarse, non-repetitive, involuntary movements affecting arms, legs, and trunk; occasional involuntary grunting noises; perioral twitchings. Mental characteristics: change of character; very excitable with men; nervous and talkative. III 6:—Stated to be nervous by relatives. No evidence of Huntington's chorea present.

Pedigree Three (Fig. 3)

The first member of this family known to be suffering from Huntington's chorea, I 2 married twice, and both wives passed on the disease to the next generation.

II 1:—No details of age of onset and death are available. II 3:—Age of onset 30 years with choreiform movements; death at 45. II 5:—Onset aged 25 with choreiform movements; death aged 37.

III 1:—Unable to walk. III 2:—It is thought that this child was not healthy, but no further details could be obtained about these two children. III 5:—Died aged 6 months. III 6:—Died aged 6 years from bronchitis. III 7:—Died aged 40. III 9:—Onset of disease with choreiform movements, aged 30; died aged 40. III 10:—Onset of disease with choreiform movements at 16 years; died aged 35. III 11:—Has emigrated to Canada and nothing is known of his health.

IV 1:—It is stated by III 3 that he suffered from the disease from birth and that he died at the age of 40. III 9 married a woman (III 14) who carried the gene for pseudohypertrophic muscular dystrophy. One of their two children, IV 3, suffered from the dystrophy at 7½ years and died at 19. III 14 had previously had a baby by another man (III 15), and the child of this union suffered from the dystrophy at 3½ years of age and died at 18. This man (III 15) had also had a child by another woman (III 16), who suffered from fits, and the child born as a result of this union had his legs permanently in irons.

There is a history of insanity and fits in the antecedents of III 14: thus I 4 suffered from insanity and I 5 suffered from fits.

Pedigree Four (Fig. 4)

I 1:—Lived in Scotland and suffered from the family chorea; age at death not known.

II 1:—Free from disease; died aged 60. II 2:—Onset of disease at about 27; death aged 42. II 3:—Onset of disease at about 27; death at about 42.

III 2:—Onset of disease aged 31. Admitted to mental hospital two years ago as she was unable to manage her domestic duties and was worried and emotionally disturbed. Admitted to mental hospital again for the same reason one year ago, when the diagnosis of Huntington's chorea was made. Physical characteristics—typical athetoid movements of arms, trunk, and legs. She is unable to walk steadily. Her face is expressionless. Present age 40 years.

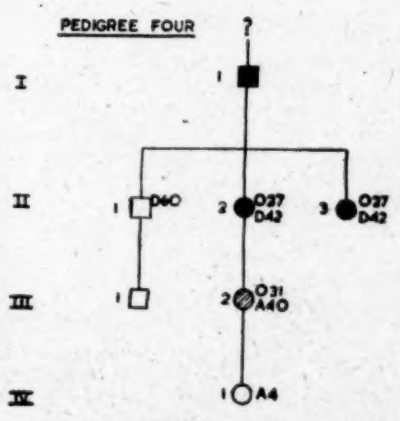

FIG. 4.—Pedigree Four.

Pedigree Five (Fig. 5)

No definite information is available about I 1, but it is known that I 2 was insane.

II 1:—Suffered from insanity and died in the mental hospital, but there is no evidence to indicate that her mental condition was due to Huntington's chorea. II 2:—Onset aged 46. Died in the mental hospital and is thought to have suffered from Huntington's chorea. There is no record of a definite diagnosis having been made, but the description of the signs indicate that almost certainly this was the condition from which he was suffering.

III 1 is aged 61. She has been in a mental hospital and is still suffering from depression, but there is no evidence that she has contracted Huntington's chorea. III 2 developed the disease at the age of 40 and died in the mental hospital at the age of 57.

IV 1:—Onset of the disease at the age of 39 with dyslalia followed by jerky movements; mental deterioration occurred late in the disease. She died in the mental hospital aged 51. IV 2 was smothered at the age of 1 year. IV 6:—Onset at age of 31 with mental peculiarity, dropping things, jerking movements; speech affected five years after onset of chorea. Died aged 43. IV 7 died aged 11 years and is known to have suffered from pulmonary tuberculosis. IV 9 died of pneumonia aged 15 months. IV 11 was killed aged 21. IV 12 died aged 12 of diphtheria. The history indicates that the remaining members of the family do not show any signs of the disease.

The apparently low incidence of the transmission of the disease-bearing gene in this family is probably explained by the fact that 5 of the 13 children in the fourth generation died before the age of 22—that is, before the age at which the disease is generally manifest. It is too early yet to say that the remaining members of this generation have not inherited the disease.

Pedigree Six (Fig. 6)

Of the eight Northamptonshire families suffering from Huntington's chorea, this is the only one in which the origin of the disease can be demonstrated. The first person to suffer from the disease was III 6. His father (II 4) worked in a factory until his death at 70; his mother (II 5) worked at making lace until her death at 71. The history was obtained from III 7, aged 78, who is emphatic that none of her mother's or father's siblings—all of whom lived to between 60 and 70 years—suffered from the disease; she is equally emphatic that III 6 was the only member of her siblings to be affected. In this patient, who died at 73, the disease originated at the age of 55, which appears to be in

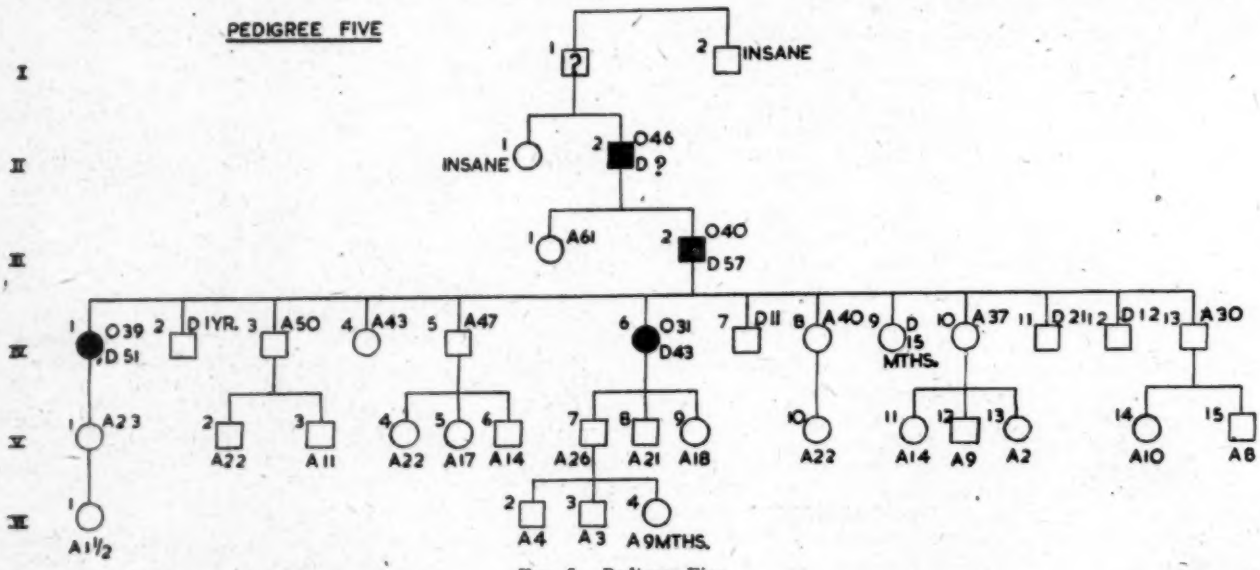

FIG. 5.—Pedigree Five.

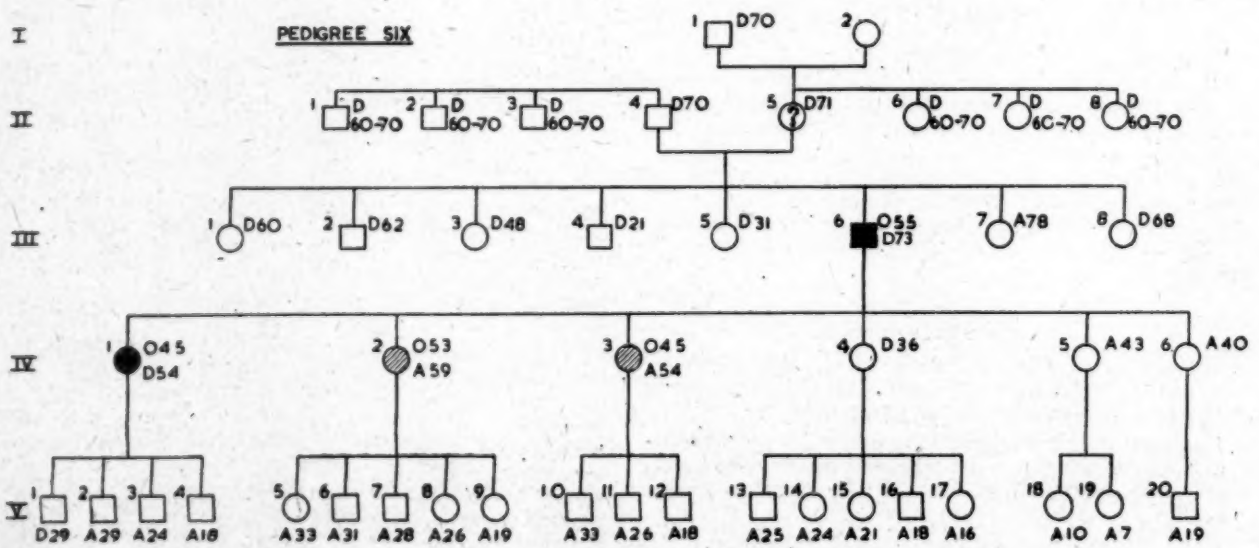

FIG. 6.—Pedigree Six.

conformity with Bell's records of late onset in initial manifestation of the chorea. He had six children, three of whom have so far inherited the disease.

In IV 1 the onset was manifest at the age of 45 and was characterized by scanning speech and choreic movements of the face, mouth, and neck. She also developed writhing movements of the shoulders, arms, and legs. Slight spasticity was present; her gait was unsteady and she used to fall down. She died at the age of 54 in accommodation provided under Part III of the National Assistance Act. IV 2 :—Onset aged 53 with choreiform movements of the fingers, arms, and legs. The progress of the disease has been slow and she is still at work. Present age, 59. She states that she can remember being taken as a child to visit her grandmother, who was in bed and who "shook," but she does not think that any of her other relatives "shook." This statement throws some doubt on the evidence of III 7 about earlier generations. Presumably a person who suffers from the disease is more likely to describe other people as suffering from a similar affliction than a person who is free from the disease, since the former does not wish to consider that she is the only member of the family suffering from "nerves," whereas the latter unconsciously opposes any suggestion that there is a family taint. IV 3, aged 54, is in an advanced state of dementia. There are ceaseless writhing movements and the face is expressionless. The age of onset was 45. IV 4 died aged 36 from ? cancer. Another female sibling in the fourth generation died at the age of 2½ years from "inflammation of the brain." She has not been included in the pedigree since there was uncertainty regarding her date of birth.

It is still too early to say that the remaining two sisters in the fourth generation are not carrying the disease-bearing gene. The three affected sisters have given birth to 12 children, so that the incidence of the chorea may well be doubled in the fifth generation. The history does not indicate that any of these children have been affected as yet.

Pedigree One illustrates how it is possible for the incidence of the disease to diminish in a family when the members become aware of the hereditary nature of the affliction; this pedigree illustrates how the disease can spread when members of a family have no inkling of its hereditary nature.

Pedigree Seven (Fig. 7)

This family came to the county from Wiltshire, and only a relatively small pedigree can be traced.

In I 1 the disease was first noted at the age of 53, and death occurred at the age of 68.

II 1 suffered from Huntington's chorea and died aged 64. II 2 also developed the disease, and died aged 51. II 3 died from pulmonary tuberculosis. No information can be obtained about II 4 or II 5. II 6 died from the disease aged 51. II 7 is in a mental hospital suffering from Huntington's chorea; she is aged 55. In her case she was admitted at the age of 46 in a state of agitated melancholia. This state progressed into dementia, and choreiform movements did not become apparent until she was 51.

The history does not indicate that any of the children of II 1 have been affected as yet.

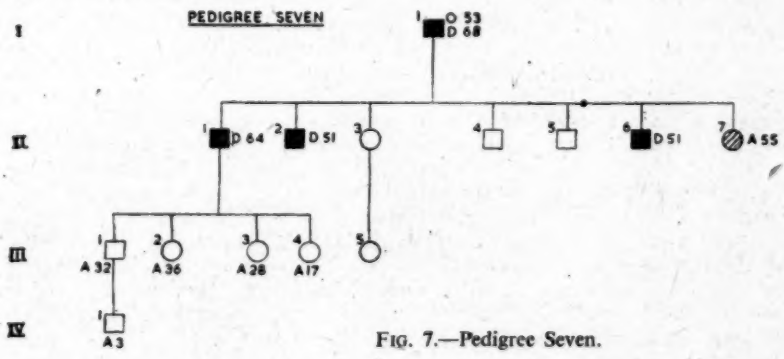

FIG. 7.—Pedigree Seven.

Pedigree Eight (Fig. 8)

I 1:—No cause for the insanity of this person can be established, but it seems probable that she suffered from familial chorea. Of her six children, only II 3 is definitely known to have been affected. The onset in his case was at 43 and death at 51 years. The ages at death of II 2, II 4, II 5, and II 6 are not known.

II 3 had six children, of whom four developed the disease. In III 1 the onset was at 41 years and death at 58. In III 2 the onset was at 45 years and death at 55. In III 3 the onset was at 16 years and death at 36; when she was 19 she had an illegitimate baby. In III 4 the onset was at 17 years and death at 40. III 5 is living, aged 70. III 6 died aged 14—? typhoid fever.

IV 1 is aged 58; onset of disease aged 53; choreiform movements slight, affecting trunk and limbs. IV 2 was killed in 1914 aged 19. IV 3 is aged 53; onset of disease was at 46, with involuntary movements of the shoulders; arms and legs affected later; at present there are jerky movements of the whole body. She appears normal mentally, but her husband states that her behaviour is irrational at times. Her face is expressionless. IV 4:—Aged 47, onset of disease aged 39, with involuntary movements of arms and legs. Unsteady in her gait; speech and mentality appear normal; her face is expressionless. IV 5 died aged 3 years as a result of an accident. IV 7 :—Aged 41; onset of disease aged 34, with involuntary movements of the hands; later the arms and legs were affected, then the speech was involved; and finally mental instability was noticed. At present her athetoid movements are general and almost continuous. She has an ataxic, high-stepping gait, walks on a wide base and not infrequently falls down. She is mentally peculiar, readily becomes angry, and is abusive and violent towards her older son. The younger son is in a children's nursery. IV 8 :—Aged 55; very nervous and emotional; would not be seen. She has been in the mental hospital for anxiety neurosis. IV 9 :—Onset of disease aged 3 years; death aged 12. This information was obtained from III 5 and her husband, who have seen the disease in three generations and are emphatic that the child suffered from the hereditary chorea and not from any other disease.

V 2, aged 34 years, is very nervous, hates crowds, and is of an excitable disposition; does not remain still. He is not classed as a case of Huntington's chorea. V 5 and V 6 were stillborn. V 7 died aged 18 months—"paralysed."

Diagnosis

In a survey of this nature it is necessary that the diagnosis shall be established with certainty. Of the 13 patients in the series who are alive, 12 exhibit the involuntary athetoid movements which are pathognomonic of the disease, while in the thirteenth the criteria for diagnosis are: serious mental deterioration, spasticity, an expressionless face, a stooped posture with a festinating gait, and the gross difficulty in speech which has characterized the disease in his family.

It will be seen that the pedigree is of great value in establishing the diagnosis, particularly in those cases in which insanity precedes the chorea. Jelliffe (1910) stated that some English psychiatrists did not seem to recognize Huntington's chorea and that cases in English asylums were diagnosed as catatonia, dementia, or chronic mania. This observation was reiterated only last year by Bickford and Ellison, who wrote that they had seen cases in Cornwall diagnosed as Parkinson's disease, disseminated sclerosis, neurasthenia with ataxia, and dementia with creeping paralysis. Further evidence is provided by Spillane and Phillips, who, in their inquiry in South Wales in 1937, reported that *only two of the fifteen cases they observed had previously been*

diagnosed; they considered that other cases were hidden away among the population. From this it would seem that accurate collation of family pedigrees by the medical officers of the local health authority would render a useful service both to practitioners and to hospital clinicians in all cases where Huntington's chorea should be excluded from the differential diagnosis.

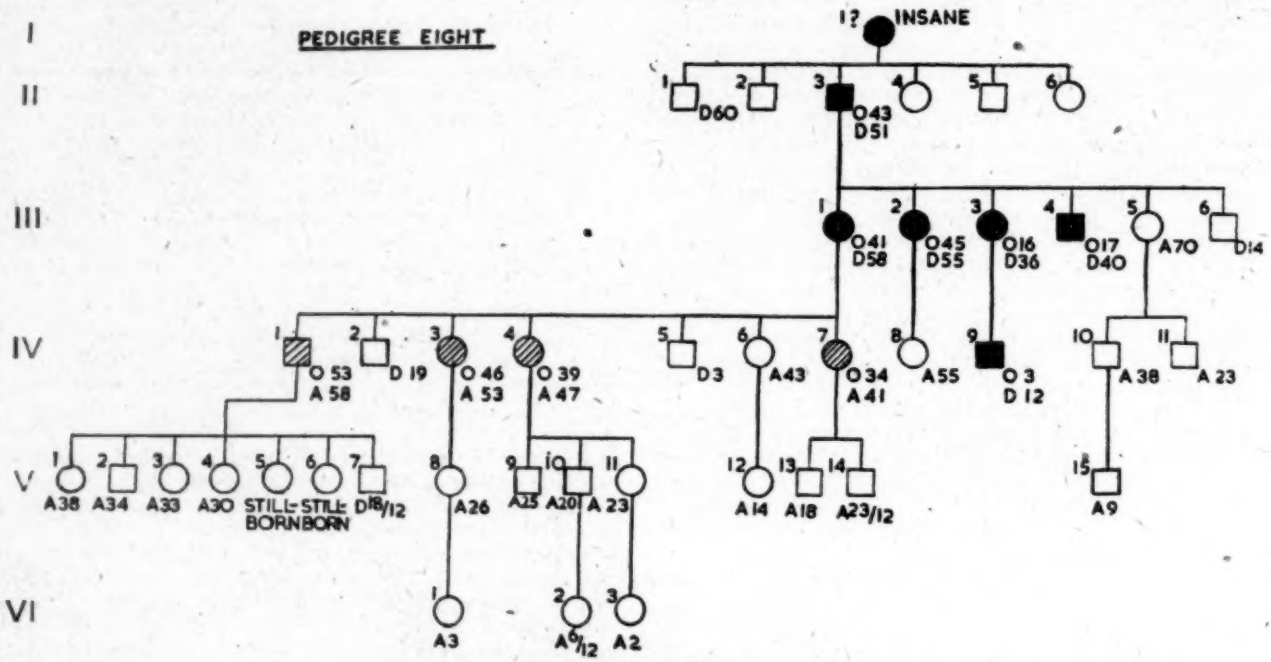

FIG. 8.—Pedigree Eight.

Incidence

On first consideration it might seem surprising that a fatal hereditary disease such as Huntington's chorea still persists in the community and that so deleterious a gene has survived the process of evolution. Haldane suggests that the age of onset in middle life may merely mean that primitive men and women seldom lived much beyond 40, so that postponement of onset beyond that age had no selective advantage. In addition, heightened sexual interest, possibly due to cortical degeneration, is not infrequently one of the early features of the disorder, and it may be that in this peculiar manner afflicted families have propagated the disease and so avoided extinction. Thus Reed and Palm (1951) found that in the pedigrees they investigated the average number of children from affected individuals was 6.07 ± 0.9 and from their unaffected sibs 3.33 ± 0.5, the difference between the two means of 2.74 ± 1.03 being statistically significant. In this country, Bell records an average number of 4.4 children where the mother is affected and 5.0 children where the father is affected.

The findings of the present survey denote an incidence of approximately 5 patients suffering from Huntington's chorea per 100,000 of the population. Bickford and Ellison (1953) obtained a higher figure amongst only those Cornish families who had a member in the mental hospital, so that the true incidence of the disease in that county is likely to be considerably greater. This, however, is probably related to the limited movements of the population in Cornwall on account of its isolated geographical position. In the London area, the 80 patients described by Minski and Guttmann in London County Council hospitals in 1938, if expressed as a proportion of the London County Council population at that time, give an incidence of 1.8 cases per 100,000; but here, too, reference was made only to those families which had a member in hospital. Critchley's survey in 1934 indicated a relatively high incidence of the disease in Suffolk, but again he was dealing only with certified patients, and the majority of choreics do not enter a mental hospital until the disease has reached an advanced stage. In this connexion Hughes (1925) found that in the state of Michigan there were, on an average, four domiciled choreics for each hospital case, but this observation may not be applicable here. Curran (1930) states that the incidence is higher in rural than in urban communities, but this does not hold good in Northamptonshire, where most of the families live in the industrial districts.

In a disease transmitted by a dominant gene the number of children who will inherit the disorder from an affected parent must vary greatly. It follows, therefore, that in a survey of this nature, unless the population sampled is very large, the number of persons found to be suffering from Huntington's chorea will show consequent variations. Nevertheless, it can be said that there is no evidence to indicate that the incidence of the disease is higher in this county than elsewhere; and if these figures are representative for the country as a whole then there are at present more than 2,000 people suffering from Huntington's chorea in England and Wales.

Care of the Patient

Treatment.—Goldman (1952) reported that oral procaine amide had given beneficial results in the control of choreiform movements. In this survey six patients with gross movements were treated with increasing doses of procaine amide over periods of more than six weeks, but no beneficial effect was noted which could be attributed to the use of the drug.

Supervision.—Domiciliary care obviously is preferable to institutional supervision, but unfortunately the antisocial behaviour of the patient frequently means that control in the home is inadequate. Mental instability, character changes, and sexual precocity not infrequently precede the chorea and are accompanied by a fall in the standard of living and the social class. It is probable that patients from the professional classes can be cared for longer in their homes, and Curran states that the majority of patients come from these classes. In this county, however, the families were found mainly in that section of the community classed by the Registrar-General as Group IV (namely, partly skilled occupations) where domiciliary supervision presents considerable difficulties.

Serological Table

Pedigree No.	Blood												Taste
Pedigree Two													
II 8*	O	MN	R_1r	PP	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk	Fy^{a+}		N
III 1	A_2	MN	R_2r	Pp	Le^{a-}	Le^{b+}	S		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	N
III 2	B	MN	R_1r	Pp	$Le^{a+}Le^{a+}$		ss		Lu^b Lu^b	kk	Fy^{a+}		N
III 3	A_2	MN	R_1r	Pp	Le^{a-}	Le^{b-}	S		Lu^b Lu^b	kk	Fy^{a+}		N
III 4*	O	N	R_1R_2	Pp	Le^{a-}	Le^{b+}	S		Lu^b Lu^b	kk	Fy^{a+}		N
III 5	O	N	R_2r	Pp	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk	Fy^{a+}		N
III 6	A_1	MN	R_1r	Pp	$Le^{a+}Le^{a+}$	Le^{b-}	ss		Lu^b Lu^b	kk	Fy^{a+}		N
Pedigree Eight													
III 5	O	MN	R_1R_2	PP	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	N
IV 1*	A_1	MN	R_1R_2	pp	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	N
IV 3*	O	N	R_1R_1	Pp	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	N
IV 4*	A_1	N	R_1R_2	Pp	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk	Fy^{a+}		N
IV 6	A_1	N	R_1r	Pp	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	N
IV 7*	A_1	MN	R_1R_2	Pp	Le^{a-}	Le^{b+}	ss		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	N
IV 10	O	MN	R_1r	Pp	Le^{a-}	Le^{b+}	S	Lu^{a+}		kk	Fy^{a+}		N
IV 11	O	MN	R_2r	Pp	Le^{a-}	Le^{b+}	S	Lu^{a+}		kk	Fy^{a+}		N
V 1	A_1	M	R_2r	Pp	$Le^{a+}Le^{a+}$	Le^{b-}	ss		$Lu^{b+}Lu^{b+}$	kk		$Fy^{b+}Fy^{b+}$	N
V 2	A_1	MN	R_1r	Pp	$Le^{a+}Le^{a+}$	Le^{b-}	ss		Lu^b Lu^b	kk		$Fy^{b+}Fy^{b+}$	No record
V 3	O	MN	R_2r	Pp	Le^{a-}	Le^{b+}	ss		$Lu^{b+}Lu^{b+}$	kk		$Fy^{b+}Fy^{b+}$	N
V 8	O	N	R_1R_1	Pp	Le^{a-}	Le^{b+}	ss	Lu^{a+}		kk	Fy^{a+}		N
V 10	A_1	N	R_1R_2	Pp	Le^{a-}	Le^{b+}	ss		$Lu^{b+}Lu^{b+}$	kk	Fy^{a+}		N
V 11	A_1	MN	R_1R_2	Pp	Le^{a-}	Le^{b+}	ss		$Lu^{b+}Lu^{b+}$	kk	Fy^{a+}		N
V 12	A_2	N	R_1r	PP	Le^{a-}	Le^{b+}	ss		$Lu^{b+}Lu^{b+}$	kk		$Fy^{b+}Fy^{b+}$	NT
V 13	O	N	R_2r	PP	Le^{a-}	Le^{b+}	ss		$Lu^{b+}Lu^{b+}$	kk	Fy^{a+}		N
V 14	A_1	M	R_1r	Pp	Le^{a-}	Le^{b+}	ss		$Lu^{b+}Lu^{b+}$	kk		$Fy^{b+}Fy^{b+}$	No record
V 15	O	N	R_1R_1	PP	Le^{a-}	Le^{b+}	S	Lu^{a+}		kk	Fy^{a+}		N
VI 1	O	N	R_1R_1	Pp	Le^{a-}	Le^{b+}	S	Lu^{a+}		kk	Fy^{a+}		N

* Suffers from Huntington's chorea. N=Normal perception of taste. NT=Non-taster.

Prevention of the Disease

(a) Prediction

Serological and Hereditary Factors.—In this present survey samples of blood were taken from members of two of the families (Pedigrees Two and Eight) and subgrouped at the Radcliffe Infirmary, Oxford, as it was hoped that the results obtained might have some bearing on genetic linkage. These persons were tested also for taste factor (phenylthiocarbamide—50 parts per million). In the event, no significant data were obtained, but the results are placed on record (see Serological Table).

Electroencephalography.—Attempts at accurate prediction by means of electroencephalography have been made, but with conflicting results, and the original claims of Patterson *et al.* (1948) have not been substantiated by Harvald (1951) or Leese *et al.* (1952). In this inquiry electroencephalographic records were obtained in six persons, four of whom were suffering from the disease in an advanced stage. These records, which were made by the electroencephalographic department of the Radcliffe Infirmary, Oxford, did not reveal any definite abnormalities which might be of value in the diagnosis of the disease, so it was felt that no useful purpose would be served by obtaining tracings from other patients.

(b) Health Education

There can be few diseases more distressing than Huntington's chorea either to the patient or to the relatives. The former, after suffering from increasingly uncontrollable movements for many years, inevitably die in a demented state. Often they have to be nursed in cot beds in order to prevent them from injuring themselves. The relatives spend their lives in fear and apprehension lest they and their children fall victim to the disease.

The real gravity of the chorea, however, lies in its hereditary nature. The child of an affected parent stands a 50% chance of contracting the disease; if he marries without waiting to see if he has the disorder, then he can assume that his children stand a 25% chance of inheriting it. The hereditary pattern is so definite that every effort should be made to prevent its spread, and eugenic advice should be given to members of afflicted families. The experience of this survey indicates that such advice is welcomed. Although many members of a family may be afflicted, the true hereditary character of the disease is not understood by them, and their lack of knowledge makes them the more fearful. Rational explanation can do much to relieve them of the wretchedness of unnecessary anticipation.

Such health education, to be effective, should be given to all members of the family, but as a rule only a few members are under the care of any one practitioner. It may well be that a doctor does not know that his patient comes from a choreic family. As an illustration of this, III 4 of Pedigree Two was advised not to have any more children, but her brother and his consort were receiving treatment for infertility.

The local health authority is in a fortunate position in being able to work in close liaison with the general practitioners and the mental hospital. Moreover, under Section 51 of the National Health Service Act they are responsible for the prevention and aftercare of mental illness. In undertaking home visiting the medical officer can obtain details of family trees which may assist both the practitioner and

the hospital clinician regarding the diagnosis, and at the same time he can give the necessary advice to prevent the spread of the disease.

Mutation

It might be argued with justification that if the mutation rate of a hereditary disease is high there is little object in trying to prevent its spread. In Huntington's chorea, however, it is clear that the great majority of cases are inherited, and the proportion of persons who owe their disease to a mutation in one or other parent is very small indeed. Hence, if it were possible to prevent the transmission of the gene the incidence of the disease would be very greatly reduced. Although one possible instance of mutation in an earlier generation is demonstrated in the present series of eight pedigrees, Bell quotes only 6 out of 151 pedigrees.

These observations indicate that the following measures would be of value: (1) Practitioners should be encouraged to notify all cases of Huntington's chorea to the local health authority so that the family pedigrees can be investigated. (2) (i) Offspring of an affected parent who are of Roman Catholic faith should be advised against marriage. (ii) Offspring of an affected parent who are of Protestant faith should be advised not to have children, and should be encouraged to attend a birth-control clinic. The help of all churches would be of great value in undertaking these measures. It is noteworthy that the Minister of Health has sanctioned contraceptive advice at birth-control clinics "only in cases where further pregnancy would be detrimental to health." It would, however, appear only logical that the health of the offspring should be protected in the same way as the health of the parent. (3) Termination of pregnancy should be considered if either parent is suffering from the disease or may be carrying it. (4) Friendly supervision of members of choreic families should be maintained by whoever is in the best position to do so effectively. In some cases this could be the responsibility of the practitioner, in others of the district nurse, the health visitor, or the mental health worker. (5) As soon as domiciliary care is found to be inadequate, the patient should be admitted to an institution or mental hospital.

Summary

Although Huntington's chorea is described as a rare disease, no attempt has been made to assess the incidence in this country. In the present survey a questionary was sent to the senior partner of every practice in Northamptonshire, and with the consent of the medical superintendent of the county mental hospital the records of certified patients were made available. The results indicated that the incidence of the disease in Northamptonshire is approximately 5 diagnosed cases per 100,000 of the population. No conclusions can be drawn from such small figures in a population of about 263,000, but if this incidence is representative for the country, then there are at present more than 2,000 people suffering from Huntington's chorea in England and Wales.

It is noted that choreic families appear to be drawn mainly from Group IV of the Registrar-General's social classification.

In this survey six patients were treated with procaine amide, but no beneficial results were observed which could be attributed to the drug.

Electroencephalographic and serological investigations were carried out on members of two choreic families. The results were not found to be of any significance in prediction or diagnosis, but the serological findings may be of value in future work on this subject.

Adequate supervision of choreic individuals is very desirable on account of the heightened sexual interest and fecundity associated with cortical degeneration in the disease. As soon as domiciliary control is insufficient patients should be admitted to hospital.

Since there is no treatment for this hereditary disease, attention is drawn to the urgent need for its prevention through the health education of afflicted families. If medical practitioners reported the disease voluntarily, the local health authority could help by investigating family pedigrees and giving the necessary advice. This work would be both of preventive and of diagnostic value. It is felt that prevention is by far the most important aspect of Huntington's chorea, and that every effort which is possible in a voluntary capacity should be made in an attempt to reduce the incidence of the disease.

I should like to express my thanks to Dr. C. M. Smith, County Medical Officer of Health, Northamptonshire, for his help and suggestions in undertaking the survey; to Dr. J. A. Fraser Roberts for his advice in the preparation of this paper; to Dr. A. N. Graham for granting me facilities to examine patients at St. Crispin Hospital; and to Dr. J. C. Goodchild for undertaking the treatment of patients with procaine amide. I should also like to thank Dr. M. M. Pickles for undertaking the serological investigations; and, finally, to express my appreciation of the co-operation received from the medical practitioners in the county, without whose help this survey would not have been possible.

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PARTIAL GASTRECTOMY: TEN YEARS LATER

BY

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The operation of partial gastrectomy has received perhaps more study and investigation than almost any other operation in surgery. The value of the procedure in the treatment of peptic ulcer is now established, and the immediate results are well known. The operative mortality rate in good hands has been established at 1–2%. The post-gastrectomy syndromes have been studied in detail by Adlersberg and Hammerschlag (1947), Irvine (1948), Mimpriss and Birt (1948), Muir (1949), Wells and Welbourn (1951), and many others. Very little is known, however, about the late results of the operation and the prospects for the patient ten or more years after surgery.

Of 119 cases of partial gastrectomy performed for the treatment of peptic ulcer before the early months of 1944, 28 were traced to 1946 only, a further 16 maintained contact by letter to 1950, and the remaining 75 have been examined at frequent intervals to the present day (1954). It is the history of these 75 patients which

concerns us here. It will be appreciated that they form a highly selected group who have not died of operation or intercurrent disease, have not gone away to sea or moved residence to another city, and have not applied elsewhere for treatment. For the same reasons the group may contain a high proportion of poor results maintaining contact with us because of dissatisfaction with the end-results. In consequence, highly analytical statistical methods cannot be applied to the investigation, and we endeavour only to demonstrate the experience of these 75 patients during the ten or more years following the operation of partial gastrectomy.

The group is composed of 60 men and 15 women. At the initial operation gastric ulcer was noted in 3 cases, a duodenal ulcer alone in 57 cases, a gastric and duodenal ulcer were both present in 6 cases, and in 9 cases no detail is available. Gastric resection for neoplasm is not considered here.

Operation

Before 1944 the extent of gastric resection for peptic ulcer was not stabilized. In general, the resection was more limited than that undertaken at the present time. In the group studied, 15 patients had, as a primary operation, gastric exclusion performed, the pyloric end of the stomach being left *in situ*. Eleven patients had undergone a Billroth I type of gastrectomy, and in 25 cases a partial gastrectomy of the Polya type was performed with an antecolic valved type of anastomosis. In neither of these latter two groups was the resection so radical as that now carried out, and they are therefore not representative of the modern variety of each operation. Twenty-four cases were treated by the modern high gastric resection with an antecolic Polya operation, and a Finsterer–Lake valved anastomosis. Such cases are quite representative of the modern technique.

The duration of time since the initial operation in each group is shown in Table I.

TABLE I.—*Duration Since Gastrectomy*

Operation	Duration (Years)	Cases	Operation	Duration (Years)	Cases
Gastric exclusion	12	1	Limited Polya	11	5
	14	1		12	10
	16	4		13	6
	17	6		14	1
	18	2		15	1
	23	1		16	1
				17	1
Billroth I ..	13	5			
	14	4	Subtotal Polya	10	11
	15	1		11	10
	18	1		12	3

Records

Almost all the operations were performed by one of us (C. W.) and all have been examined and investigated subsequently by the other. In all cases we are in possession of the medical history of the patients since operation, with weight records, blood examinations, and such special investigations as seemed necessary. All patients have been interviewed and examined at irregular intervals up to 1949, and at least yearly since that time. Treatment or operation to correct any of the resulting disabilities has been undertaken as required, so that many of the detected abnormalities have now been relieved. The follow-up has been standardized, and entails a complete clinical examination, blood-pressure recordings, and examination for overt evidence of vitamin deficiency and oedema. The weight is taken, and a blood sample for haemoglobin and red cell count, and for packed cell volume if required. Glucose-tolerance investigations and faecal-fat estimations were performed when judged necessary.

For the purpose of this study, the patient is not regarded as having developed anaemia unless the haemoglobin falls below 90% in the male and 80% in the female (100% = 14.8 g. per 100 ml.). Subsequent weight changes are considered in relation to the highest weight known before operation (called "health" weight), and the weight immediately before operation. A weight loss or gain in relation to each of these figures (where known) is not regarded as significant unless the difference between these weights and subsequent weights varies by more than ± 7 lb. (3.2 kg.). This figure is arbitrary, but allows for difference in accuracy of the weighing-machines used.

Results

Gastric Exclusion Operation.—15 cases (males, 13; females, 2). In this operation the pyloric antrum is conserved in continuity with the duodenum but out of the food-stream. For a brief period, ending in 1937–8, it was performed electively, but was soon abandoned because of its bad results. Thereafter it has occasionally been carried out as a first-stage procedure. As late as 1940 one, and in 1942 a second, patient was allowed to go on indefinitely without being submitted to the intended pylorectomy. In only one case was the antral mucosa cored out (Bancroft's procedure) at the time of the initial operation. Seven of these 15 patients later developed a stomal ulcer, and another two required pylorectomy for the relief of ulcer symptoms, though no ulcer was demonstrated (Table II). Of these nine patients four obtained complete relief of ulcer symptoms when a subsequent pylorectomy was performed, three continued to have further pain or bleeding, but no further operative treatment was undertaken, and in two cases subsequent subtotal Polya gastrectomy was performed. It should be noted that, of the two patients who were subjected to secondary subtotal gastrectomy, one developed such severe bilious regurgitation with associated symptoms that a jejunoplasty was required to relieve the condition. (Incidentally, this would not be our operation of choice to-day.) Table III

TABLE II.—*Results of Gastrectomy*

Operation	Total No.	Well	Stomal Ulcer	Acid Dyspepsia	Bilious Regurgitation
Gastric exclusion ..	15	6	7	2	0
Billroth I (limited)	11	5	2	4	0
Limited Polya ..	25	18	2	3	2
Subtotal „ ..	24	18	0	1	5

indicates that nine of these patients developed a hypochromic microcytic anaemia at some date subsequent to operation and that one patient developed evidence of severe riboflavine deficiency. These deficiencies all responded to the appropriate treatment—namely, oral or intravenous iron and oral or parenteral vitamin B. Records of blood examinations were not available in one instance. Table III shows the weight records of all but one of these 15 patients.

TABLE III.—*Anaemia, Vitamin Deficiency, and Weight Changes*

Operation	Anaemia	Vitamin B Deficiency	Weight						Hypoglycaemia	Flatulence
			Health			Pre-operation				
			Gain	Same	Loss	Gain	Same	Loss		
Gastric exclusion ..	9	1	1	3	10	6	3	5	—	2
Billroth I (limited) ..	0	2	3	2	6	4	2	5	1	—
Limited Polya	9	2	2	9	14	15	5	5	1	1
Subtotal „	7	0	3	7	14	10	7	7	—	1

Billroth I Gastrectomy.—11 cases (males, 7; females, 4). It will be borne in mind that a somewhat limited gastric resection was undertaken. Table II indicates the high incidence of recurrent ulceration. Only one case developed

a mild anaemia, and two patients showed evidence of riboflavine deficiency. Table III indicates the weight changes.

Limited Polya Gastrectomy.—25 cases (males, 18; females, 7). Of 25 cases of limited gastric resection and valved anastomosis, five subsequently developed symptoms of peptic ulceration. In two cases these symptoms subsided with dietetic measures and alkali. In the third case a subtotal Polya-type gastrectomy was performed two years after the first operation to relieve dyspeptic symptoms. There is no record that an ulcer was observed at the second operation. In the fourth case a jejunal ulcer developed and perforated within six months. This perforation was treated elsewhere by simple closure. Ten years later a gastro-jejuno-colic fistula was diagnosed, the fistula was closed, and a higher gastrectomy was performed. In the fifth case symptoms of recurrence were evident within a year, but the barium meal did not show ulceration, and nothing was done. Ten years after the operation bilious vomiting started and was associated with dyspeptic pain. Barium meal examination showed evidence of stomal ulceration and a transthoracic vagotomy was performed. Since that time she has remained well. Table III indicates that nine of these patients subsequently developed anaemia of the iron-deficiency type, and that two patients developed signs of riboflavine deficiency. The weight records are also shown in Table III.

Subtotal Polya Gastrectomy.—24 cases (males, 22; females, 2). These patients differ from the previous group only in that the gastric resection was more extensive and approximated to the modern subtotal operation. Of these 24 patients only one developed subsequent dyspeptic symptoms, five years after the operation. Although no stomal ulcer was detected, a transthoracic vagotomy was carried out eight years after the first operation. However, five of this group developed symptoms of afferent loop stasis (bilious vomiting), one so severely that jejunoplasty was necessary to relieve the condition. It is interesting to note that this bilious vomiting did not become evident until eight years after the operation in two cases, and seven years in two others.

Table III demonstrates that nine patients developed some anaemia subsequent to surgical treatment of their ulcer, and one showed evidence of vitamin B deficiency. Table III gives the weight records.

Discussion

Recurrent Ulceration

It has long been known that gastric exclusion operations, leaving the pyloric antrum *in situ*, are unsatisfactory. The melancholy history of this group of patients in the series only confirms this view. It is curious that the incidence of recurrent ulceration in this group is probably higher than after simple gastro-enterostomy. This is probably related to the amount of bicarbonate secreted by the pancreas and returned to the stomach by the afferent loop. In the stomach this bicarbonate partially neutralizes the free acid present. Not unnaturally, the amount of bicarbonate secreted bears a direct relationship to the amount of acid secreted. Moreover, the secretion of bicarbonate occurs most freely in response to the presence of acid in the duodenum. It follows that after gastro-enterostomy there is more antacid carried to the stomach by the afferent loop than there is after a Polya gastrectomy (especially if valved), which excludes all acid from the duodenum.

In this series, the limited Billroth I operation has been found unsatisfactory as a means of preventing recurrent ulcer. This experience, though not conclusive, would make us cautious about adopting an even higher gastric resection and Billroth I anastomosis in cases of duodenal ulcer. Recently, however, we have been impressed with the advantages of moderate gastric resection and gastro-duodenal anastomosis when combined with vagal section.

Our interest in this series centres mainly round the group of 49 cases in which partial (25) or subtotal (24) gastric resection was undertaken with a Polya-type valved anastomosis. Seven cases have developed dyspeptic symptoms, and, of these, two have been very mild and have subsided during the period under review. In the remaining five cases, subsequent treatment for recurrent peptic ulcer has been carried out. In this respect—namely, the prevention of recurrence of peptic ulceration—the operation has been only reasonably successful over a period extending from 10 to 15 years. It will be noted, however, that the recurrence rate was high only where a limited resection was carried out. As would be expected, the best results have been obtained with high subtotal gastrectomy.

Ability to Work

All these 49 patients have been able to return to their former employment. In several cases this has included heavy work in engineering factories, docks, and stores. Seven of these patients have lost considerable time from work since their initial operation. In one case this was due to severe anaemia. This patient was able to return when his blood picture became normal. In respect of ability to resume work, the operation has therefore been successful. Medical treatment alone can offer comparable advantages neither as a curative measure nor as an economic factor.

Post-gastrectomy Symptoms

The adverse effects, such as they are, of this type of operation must now be considered. Almost all the patients after any of the operations have found that they were unable to eat as much food as when in normal health. With the passage of time they have been able to eat an adequate and varied diet, and have experienced little disability. It has not been possible to be precise about the incidence or the importance of nausea, distension, flatulence, and weakness after a meal. Over a period of ten years, every patient may have experienced these symptoms at some time. Even the exclusion of articles of food from the diet may result from prejudice, misunderstanding, or mistaken advice. We have considered all those patients in whom the symptoms have been sufficiently severe and persistent to affect their satisfaction with the operation. In all those suffering from such disability, bilious vomiting has, perhaps rather oddly and surprisingly, been an associated and preponderant complaint. All such cases have accordingly been classified under the heading bilious regurgitation.

Table IV shows that, of the eleven cases of Billroth I gastrectomy, one patient suffered from mild hypoglycaemic symptoms and one from occasional vomiting of food and bile. Of the 15 cases of gastric exclusion, two patients at the end of 10 years could still eat only small meals, and another two suffered from afferent-loop stasis and bilious regurgitation. True post-gastrectomy syndromes were therefore not common in these cases of limited gastric resection. The comparison between the 25 cases of partial resection with the Polya anastomosis and the 24 cases of subtotal resection with the same type of anastomosis is perhaps more instructive. In the group of limited gastric resections, symptoms of afferent-loop obstruction with slight bilious regurgitation after a meal associated with nausea and distension occurred in only two patients, whereas in the group undergoing subtotal resection five patients suffered from this troublesome disturbance, and in one case the symptoms were severe enough to require jejunoplasty for its relief. We have considered this complication of afferent-loop stasis following gastrectomy at length elsewhere (Wells and MacPhee, 1952), and concluded, in a much larger series than the present, that the condition is more common where high gastric resection is undertaken.

TABLE IV.—*Post-gastrectomy Symptoms*

Operation	Bilious Regurgitation	Vomiting (Food)	Hypoglycaemia	Flatulence
Gastric exclusion (15)	2	—	—	2
Billroth I (11)	—	1	1	—
Limited Polya (25) ..	2	—	1	1
Subtotal Polya (24) ..	5	—	—	1

The weight records show that malnutrition, as such, has not been common, and has usually been associated with stomal ulcer.

Anaemia

In the series under review the incidence of anaemia has been nil in the cases of limited gastric resection in the Billroth I manner. In the group of gastric exclusion operations more than 50% have subsequently suffered from moderate or severe degrees of anaemia. Five of these nine patients have, however, suffered from recurrent ulcer and some from overt bleeding during this time. This group is therefore aggravated by blood loss. In this small series the patients undergoing the Polya type of operation appear to be particularly prone to anaemia. In the group with limited gastric resection the inqidence of anaemia was approximately 30%, as it was in the cases of subtotal gastric resection. We are not prepared to suggest that the particular operation is prone to cause anaemia, but it does appear that, when food no longer passes through the duodenum, anaemia is apt to develop, and that, short of total gastrectomy, the incidence of anaemia is independent of the extent of the gastric resection.

In all cases under review the anaemia was of the microcytic hypochromic type which responds rapidly and adequately to iron therapy, usually by mouth. In only a few cases was iron absorption so deficient that parenteral therapy was required, but that method always proved effective.

In no case did we detect a true megaloblastic anaemia. Indeed, in a study of over 500 patients who have undergone partial gastric resection we have been unable to detect more than two cases of true megaloblastic anaemia. Analysis of the present series indicates that anaemia may develop slowly at any time during the subsequent progress, and the incidence seems to rise with the passage of time.

Loss of Weight

We have endeavoured to compare the weight subsequent to operation with the best weight of the patient in health and with the immediate pre-operative weight. In general, the pre-operative weight has been less than the "health" weight, and often considerably so. We believe that we have again demonstrated a parallelism between extent of the gastric resection and loss of weight in later years. In the group with the least extensive gastric resection (Billroth I gastrectomy), three of the nine patients actually show an increase in weight over their best health weight, and four show an increase over the pre-operative weight. As will be seen from Table III, in the cases of limited Polya gastric resection, two patients gained weight in excess of their best health weight, and nine equalled their health weight, while fourteen never regained it. In relation to their pre-operative weight, fifteen surpassed this, five equalled it, and only five lost weight continuously after operation. In the twenty-four cases of subtotal resection, three surpassed their health weight, seven equalled it, and fourteen never regained it. In relation to their pre-operative weight, ten surpassed it, seven equalled it, and seven continued to lose weight.

Where a serious weight loss does occur we have found it difficult to correct. We have observed (Wells and Welbourn, 1951) that in cases of deficient fat absorption the faecal-fat concentration can be reduced by the administration of ganglion-blocking agents such as hexamethonium bromide. In the present series, for various reasons, we have administered this drug to three patients, but have not detected any weight gain. We have observed a satisfactory weight increase in one patient whose diet was supplemented with extra protein in the form of "casilan" (Glaxo).

Intestinal Motility Disorders

Considerable work has been done in the Liverpool University department of surgery on this subject (Wells and Welbourn, 1951; Glazebrook, 1952; MacPhee, 1953). We have not observed any such disorder in the present series. We can only deduce from this that these patients were fortunate in not having such an inherent defect.

Vitamin B Deficiency

We have observed clinical evidence of riboflavine deficiency in five patients of the present series, but have not detected any true evidence of deficiency of other factors of the B group. It is curious that the patients suffering from riboflavine deficiency were not those who showed evidence of loss of weight; indeed, two exceeded their original "health" weight. This demonstrates a selective absorption deficiency which is not constant for all dietary articles. Our previous evidence of avitaminosis-B (Welbourn *et al.*, 1951) suggested that it occurred in about 10% of all patients who have undergone gastrectomy. This figure is substantiated by the results of the present series. Further, we have no evidence to show that within limits the extent of gastric resection has any bearing on the development of avitaminosis-B.

Conclusions

It is not surprising that the resection of one-half or more of the stomach for disease should modify the patient's health and even his mode of life. Until now, however, it has not been made clear just how extensive this interference with health might be. It is customary, for example, to suggest that the "dumping" syndrome subsides or is reduced within a few months of operation, but the patient is rarely followed up long enough to see whether in fact this is true.

In this study we have disregarded mild postprandial distension, and even the inability to eat certain articles of diet. We have concentrated rather on recurrent ulcer, on serious "dumping" which happens to have been associated with bilious regurgitation, on anaemia, and on vitamin deficiency. The variety and, in some instances, the inadequacy of the operations in the earlier cases should be considered in any critical analysis of our series. This study shows that half the patients can be regarded as having been free from all the disabilities of gastrectomy during the ten-year period. If anaemia and vitamin deficiency (which with rare exception are easily corrected) are excluded, the number of patients in this series of 75 free from complications rises to about three-quarters. It seems possible, therefore, that in the original 119 cases treated, disability resulting from gastrectomy arose in at most 25% of cases, more probably 15%, but the liability to these complications continued to operate over the years. The accompanying Chart shows

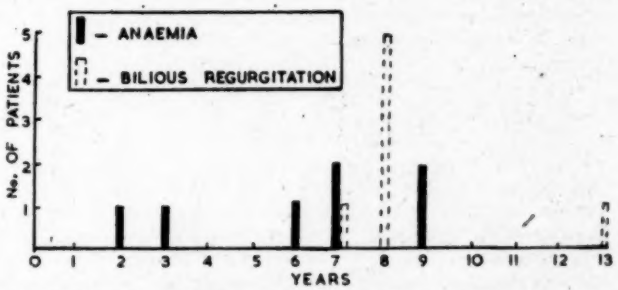

Chart showing time of onset of anaemia and bilious vomiting after partial or subtotal gastrectomy.

the detected onset of anaemia in seven patients and of bilious vomiting in seven patients after partial or subtotal gastrectomy. It will be observed that the onset of these disabilities may be delayed for many years, and the remote incidence cannot be calculated from the study of patients who have only recently undergone operation. It is neither correct nor proper to praise or blame gastric surgery on such evidence.

We do not wish to belittle the value of gastrectomy in the treatment of peptic ulcer—quite the reverse. If we except the groups of gastric exclusion and limited Billroth I gastrectomy, which will not be repeated, freedom from recurrence of peptic ulcer, and even of the symptoms of peptic ulcer, has been provided for over 85% of the patients for ten years or more, and may reasonably be expected to continue. Medical measures can offer nothing like this in

the way of effective treatment, and, indeed, the value of the medical treatment of peptic ulcer has recently been sharply questioned. Martin and Lewis (1949), in a study of 185 patients undergoing medical treatment for peptic ulcer, found that only 20% remained free from dyspeptic symptoms, that 40% endured recurrent ulcer symptoms, and that the remaining 40% required operative treatment. Evans (1954) has reported a failure rate greater than 50% in the medical treatment of peptic ulcer in a series of 111 patients. It is in the light of such studies that we can best appreciate the results of surgical treatment.

A complacent satisfaction with surgical results cannot, however, be accepted, and the lessons to be learned from a study such as this are clear. Any operation which leaves the antrum of the stomach intact is a dangerous measure. This has long been appreciated. A limited gastric resection with gastro-duodenal re-anastomosis is apt to lead to recurrent ulcer. A more extensive gastric resection in the Billroth I manner would avoid this trouble, but the technical problem of the anastomosis becomes difficult with penetrating duodenal ulcer. If vagotomy is combined with such an operation, recurrent ulcer may be avoided, and we believe this is probably the best form of treatment for peptic ulcer, and it is the principle we now follow and recommend in all cases. The Billroth I operation appears less likely to cause anaemia over the course of years, and, because there is no afferent loop, true bilious regurgitation and the prodromal symptoms associated with it are avoided. The vomiting of food mixed with bile does, however, occur, but it is not common.

The Polya type of gastrectomy is still that favoured by most surgeons. As might be expected, it seems from our study that the higher the resection the greater the freedom from recurrent ulcer but the more probable the development of serious post-gastrectomy syndromes. The very high subtotal resection is a grave offender in this respect, and is not the surgical answer to the problem of peptic ulcer treatment. A more limited resection accompanied by vagotomy may achieve the same freedom from ulcer, and lead to less serious post-gastrectomy syndromes. We have been impressed with a small series of 25 cases treated by us in this way three years ago, but it is yet too early to talk of their end-results.

Whatever the surgical method of treatment for peptic ulcer employed, a careful examination of the results must be undertaken at regular intervals. Only in this way is it possible to achieve effective treatment and satisfaction for the patient.

Finally, we may fairly claim to be gaining some understanding of the causes of disability after surgery for simple peptic ulcer. On the basis of this understanding we can see more promising initial operations developing, and, so far as concerns those who have had their operations and are still not well, we can predict with some accuracy the likelihood of response to drugs and diet, and we can recognize with some certainly those who need to face yet another surgical ordeal. To them we are beginning to be able to offer a reasonable promise of lasting relief based upon our better understanding.

Summary

In a series of 119 patients treated for peptic ulcer by partial gastrectomy 10 or more years ago, 75 patients have been regularly examined and their progress studied. The following conclusions were drawn.

1. With any type of anastomosis, the incidence of recurrent ulcer varies inversely with the extent of the gastric resection.

2. With the Polya type of anastomosis, the incidence of bilious vomiting and associated symptoms varies directly with the extent of the gastric resection.

3. Serious post-gastrectomy symptoms may not develop until many years after the operation.

4. If direct gastro-duodenal continuity is not re-established at the time of operation, hypochromic anaemia is apt to occur.

5. A more limited gastric resection combined with vagotomy and a gastro-duodenal anastomosis may represent the Aristotelian mean in the surgery of peptic ulcer.

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A LONGITUDINAL RESEARCH IN CHILD DEVELOPMENT AND SOME OF ITS PROBLEMS

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Expression is not infrequently given to the need for studies of child development in which the growth of a number of individuals could be watched and recorded as it takes place, through the years of infancy and childhood to maturity.

Another need sometimes expressed is for an integration of knowledge on the physical, intellectual, and emotional aspects of personality through the collaboration of specialists in the relevant disciplines. The present research was initiated to meet these requirements.

Previously in this country studies have been made of children at particular ages or over certain periods of development, but it is recognized that many problems can be adequately investigated only by longitudinal methods. Furthermore, in this study account is taken of some of the many environmental factors affecting mental and physical development, and in particular of the influence of the changing family background. Several longitudinal studies are in progress in the United States (see Tanner, 1948), but this is the first study of its kind to be started in Britain, and differs from any of the American studies in various respects.

Aims

The main aims may be summarized as follows:

General.—(*a*) To study some of the relationships between development and health, mental and physical. (*b*) To use our data on normal children, for comparison

*The Child Study Research Project was started in 1949 under the general direction of Professor Alan Moncrieff, Director of the Institute of Child Health, and Miss D. E. M. Gardner, University Reader in Child Development and Head of the Institute of Education Department of Child Development, with the assistance of an Academic Advisory Committee.

with groups of abnormal children, in conjunction with other workers. We are at present recording the physical growth of children with special growth problems who are under the care of some members of the staff of the Hospital for Sick Children, Great Ormond Street. We are also in close touch with workers studying the development of mentally abnormal children. (*c*) To compare the development of our sample of London children with that of children in other countries. This aim is facilitated by the fact that one of us (F. F.) is liaison officer for those growth studies sponsored by the Centre International de l'Enfance, Paris. Those in Paris and Zurich are successfully running at the present, while one is planned to start this year in Stockholm. These studies, on the physical side, will run exactly parallel to our study, on which they were founded. We have also had the benefit of personal contact, through a member of our Academic Advisory Committee, with several of the American centres which are working along similar lines, and with two studies in Africa primarily concerned with the effects of nutrition on growth, one of which is directed by Dr. R. F. A. Deane, of the Medical Research Council.

Psychological Development.—(*a*) At various age levels to assess, so far as is possible, the child's developmental level, including cognitive abilities and, more particularly, certain personality characteristics which have been the subject of less research than the foregoing. (*b*) To study the effects on mental development of such factors as socio-economic level, overcrowding, family structure, parental methods of handling the child, and parental attitudes to it. (*c*) To relate the personality development of children to their experiences. (*d*) To throw some light on the extent to which later personality characteristics may be predicted from a knowledge of the child in earlier years.

Physical Development.—(*a*) To obtain growth curves of different bodily dimensions, showing rates of growth at different ages, and individual variations in patterns of growth. (*b*) To classify the children according to body type, using the Sheldon method (Sheldon, 1940). This is designed to study the emergence of such body types, the extent to which they change, and to relate body type to growth and health. (*c*) To study the correlation of physical growth with health, socio-economic factors, nutrition, and certain genetic influences.

Material

This consists of a small "pilot group" and a "main sample." In 1949 a pilot study was begun on 23 children. The mothers, a predominantly working-class sample, were contacted at the antenatal clinics in the same way as the main sample later.

Main Sample

(a) Characteristics

The main sample consists of the children of those parents who, at the time of contact through the antenatal clinics, and at the date of birth, were resident in the postal area of London in which the centre is situated, and had no definite prospects of moving out of that area within six months after the birth of the baby; who were expecting babies in certain selected months; whose confinements were booked at one of seven hospitals or with one of three midwives' associations; and who were willing to co-operate in the study.

Because the most intensive study was to take place in the first year of life, it was necessary to spread the intake so as to maintain a manageable load. Four groups of babies were recruited, each group covering births expected in a three-months period separated from the next group by an interval of six months, so that all months of the year were covered.

(b) Numbers and Losses

From the lists of mothers registered at the antenatal clinics serving the district 364 names were found that satisfied the sampling conditions. Of these, 92 were rejected as unsuitable on the following grounds: definite prospects of moving out of the district (59), miscarriages (13), stillbirths (4), mother died (1), mother deaf (1), mothers did not speak English (5), mothers could not be traced (7), uncooperative (2). No child was excluded from the sample after birth because of abnormality or for any other reason. In 50 cases (13.7%) the parents declined to participate in the study. Reasons given were: objections on principle (5), too many worries (15), not interested (6), "father disagrees" (15), no reason given (9).

It will be seen from Table I that 224 children were in the sample at birth and that 27 children have been lost from the sample since birth. Of these, 14 moved away out of reach, 11 parents withdrew co-operation, 1 died, and 1 was placed with foster parents, who were unwilling to participate. Withdrawal of co-operation seldom occurs after the first year, so that a limit can be predicted to the probable losses on this account; removals, however, can occur at any time, and will constitute a continuous source of loss.

TABLE I.—*Original and Present Size of Sample*

Group	Expected Delivery Dates	No. at Birth	No. at Present
A	November, December, 1951, January, 1952 ..	44	30
B	August, September, October, 1952	57	51
C	May, June, July, 1953	61	54
D	February, March, April, 1954	62*	62*
	Total ..	224	197

* Co-operation promised. Births not yet complete.

(c) Factors Affecting Co-operation

It is our experience that most parents are glad to co-operate once the purposes of the research have been fully explained to them. Their attitudes on this matter are interesting. We have found it profitable to stress the following points:

Non-interference with parents' methods of bringing up their children. This is particularly appreciated by those people who feel that with the increasing scope of public services "you can't call your child your own."

Non-experimentation.—There is a real and fairly widespread fear that research involves using children as "guinea-pigs" for some vaguely sinister end. This can usually be set at rest by a full explanation of the procedure and its main objects.

Contact with the Hospital for Sick Children.—Although it is stressed that no advice or treatment can be given at the centre, many parents welcome the prospect of a regular medical examination of the child distinct from that to be had at the welfare clinic. The specialist in the background is very reassuring to this type of parent.

An appointment system involving a separate reserved time for each child, a pre-paid reply card for mother's confirmation of the appointment, and an absolute minimum of waiting. This feature is welcomed enthusiastically by all parents, and agreement is readily secured to the spending of up to two hours at the centre (at not too frequent intervals) when it is realized that the time will be used and not wasted.

Personal photographs, taken of the child on each visit to the centre and presented to the mother on the subsequent visit, act as a strong incentive with some mothers.

Other factors carrying some weight, but usually less than those mentioned above, include the confidential nature of the records, the fact that little personal information concerning the parents is required, emphasis on the study of healthy normal children, length of time that the study including the pilot work has proceeded, its ultimate value to parents and others, and the sheer interest of watching the children develop and of taking part in a scheme of this kind.

Considerable effort is being made to encourage *continued co-operation.* Missed appointments are followed up by a psychological worker.

When families move within the greater London area they are not necessarily lost, since they are asked to continue their visits to the centre, expenses being met, and in some cases mothers have agreed quite readily to do this.

(d) Representativeness of the Sample

The sample is expected to be fairly representative of the population of the area, and probably of other large city populations, since (i) the only mothers who do not register at the antenatal clinics are the very small percentage who use private nursing-homes; (ii) the hospitals and midwives' associations co-operating account for probably more than 95% of the eligible children; (iii) the district itself is very mixed from the point of view of housing conditions and socio-economic level, containing some very old and dilapidated houses, some in better condition, some flats of medium age, and some newly erected blocks. Private gardens are almost unknown in the area, but there are a number of green squares and a large public playground. Occupations of fathers, which are given in Table II, embrace all five classes of the Registrar-General's classification. The great majority of the children are of British parentage, with some Irish, there are a few other nationalities, and a sprinkling are children of mixed marriages.

TABLE II.—*Occupation of Fathers (as analysed to date) According to the Registrar-General's (1951) Classification of Social Class*

Class	Description	No.	%
I	Professional, etc., occupations	4	2·5
II	Intermediate occupations	24	15·3
III	Skilled ,,	89	56·7
IV	Partly skilled ,,	24	15·3
V	Unskilled ,,	16	10·2
	Total	157	100

It is hoped at a later stage to compare the noncooperators with the co-operators on a number of variables. This should help us to estimate the extent of bias in the sample. It will also be possible to compare our sample with the general population, at least so far as the Registrar-General's classification is concerned.

Procedure and Methods: Pilot Study

The 23 children were visited by the psychologist at frequent intervals during the first year, and were given psychological tests and physical examinations by the research staff at welfare clinic premises. After the first year they were interviewed less frequently, but 18 of them are still seen annually at the centre for physical examination, including somatotyping, for photography, and on occasion for the trying out of techniques such as problem-solving tests, observational play sessions, projective testing, or a new physical measurement. Fourteen of them have at various times received into their homes advanced students of the Institute of Education, who assist the research team by making detailed studies of three or four families over a six-months period. Thus they have become a source of material for intensive observation, which is an integral part of the research programme. It is planned to follow up this group parallel with the larger sample, both because the very detailed case studies may prove to have value in the light of the children's later development, and because the experience gained with them at each age level is of great use in planning the wider study.

Procedure and Methods: Main Sample

TABLE III.—*Procedure*

Mother 6 to 7 months pregnant	Home visit for recruitment purposes
,, 8 ,, ,,	Interview with both parents at home
Delivery and puerperium	Information supplied by hospitals or midwife
5 days (±2 days)	Interview of mother by psychological worker
4 weeks (±2 ,,)	Physical examination and photograph of child
6 ,, (±4 ,,)	Interview at home by psychological worker
3, 6, 9, 12, 18 months (±7 days), and 24 months (±14 days) and annually thereafter	Physical examination, photograph, psychological observations on child at centre, and interview with mother

A. The Early Weeks

Recruitment Interview.—The recruitment visit is made without appointment, and is kept free and informal. Its objects are to inform the mother of the general purpose of the study, and what it involves for her; to ascertain whether the parents expect to remain in the district; to obtain consent to a second visit, when further discussion will take place with the father present, and to ascertain when he is likely to be at home for this purpose.

Antenatal Interview.—This is done by the psychologist who will continue to be responsible for maintaining contact with the case in question. Cases are divided equally between the two research psychologists. It is arranged at a time (usually the evening) when both parents are at home and free for a discussion lasting from half to one hour. The tone of the interview is kept quite informal, although certain topics are routinely covered. The objects are to explain the purposes and procedure of the study in detail, answering any queries, and enlisting the co-operation of father and mother. The questions asked at this interview include details of living accommodation and number of persons in the home, present and past occupations of both parents, their nationality, age, education, mother's prior experience of children, the names and ages of any siblings, and, if the child's grandparents are alive, how often they see the family. These questions are kept as brief as possible, and certain important information such as income is dispensed with lest inquiries should prejudice co-operation. A more general discussion follows, concerning how the parents feel about the prospect of the coming child, and its implications for them.

Information Obtained from Hospital or Midwife.—It is recognized that considerable influences upon growth may occur antenatally, obstetrically, and post-natally from a physical point of view. Comprehensive notes are made of these three periods from the notes available—from hospital, clinic, doctor, or midwife—to obtain a general overall picture with special reference to pathological processes detected in the mother or baby. On the psychological side the midwife reports on the mother's reaction to labour, and the ward sister or visiting nurse supplies details of the establishment of breast-feeding, and the mutual adjustment of mother and child in the early days.

Lying-in Interview.—This interview with the mother, done by the psychologist concerned, or psychological assistant, at eight days, lasts only about 15 to 20 minutes. Its objects are to obtain details of the feeding situation as the mother observes it, to confirm rapport, and to explore her attitudes to certain aspects of child care.

Four-weeks Physical Examination.—On this their first visit to the centre, the mother and baby are fetched and returned home by the research medical officer in his car. The visit lasts 25 to 35 minutes and a certain routine is followed, which is repeated at each subsequent visit. It differs from later visits in two respects: the baby is seen only by the physical side of the research team, and a detailed history is taken from the mother. This is particularly concerned with: (*a*) the health of the mother during this and past pregnancies; (*b*) her obstetrical history; (*c*) leading questions on illnesses, diet, medicines taken, etc., during the pregnancy; (*d*) the family history; and (*e*) the health of the baby since birth, with an account of the feeding. The routine physical investigations are described later.

Six-weeks Home Visit.—This visit, which is made by the psychologist concerned, or the assistant, consists of an interview with the mother lasting 30 to 40 minutes along the lines indicated below. Particular attention is paid to the adjustment of mother and baby to each other in the early weeks.

B. Sessions at the Centre

At 3, 6, 9, 12, 18, and 24 months, and annually thereafter, the mother brings the child to the centre for a session lasting from one and a quarter to two and a quarter hours. Both are seen first by the psychologist, who conducts an interview with the mother and makes observations on the

child, and, secondly, by the paediatrician, who photographs the child, interviews the mother regarding its health, and conducts a physical examination.

(*a*) *Psychological Session.*—During the course of the interview, observations and/or testing of the child are worked in at a convenient time. The situation varies from age to age but is standardized (within the practical limits implied by that word) for all children at a given age. An exception to this occurs when the first analysis of the data on one group reveals a weakness in the procedure, which is then rectified for subsequent groups. This applies both to interview questions and to observation of the child.

The Interview.—This is carried out at every session. It opens with a few general questions, such as "How is baby?" "Any difficulties?" "How are you managing?"—designed to allow the mother to ventilate any matters that are on her mind. There follow a number of questions the details of which vary from one age to another, covering feeding, sleep, elimination, habits, activities, speech, social behaviour, and emotional characteristics. Under all these headings questions are asked both about parental methods and about the child's behaviour. The inquiry is not confined to a search for difficulties, since exactly similar information is required by way of control on those children who seldom show any problems.

Developmental Tests.—At 6 months and 18 months, and with certain groups at other ages, the Griffiths mental development scale is used (Griffiths, 1954). This is a new scale of baby tests and inquiries regarding development, standardized on British children and used by courtesy of the author in advance of publication. It yields a quotient analogous to the development quotient employed by Charlotte Bühler (Bühler and Hetzer, 1935), and includes complete subscales for assessing locomotion, personal–social development, hearing and speech, eye–hand co-ordination and performance. For our purposes, besides providing a yardstick of the children's mental development, it provides a variety of situations in which to observe their behaviour, including tasks requiring concentration and effort, physical activity, and co-operation.

Standard Situations.—At 9 and 12 months a series of standard situations are employed to reveal the baby's responses to a (comparatively strange) examiner, his dependence on his mother, his self-sufficiency when placed in a play-pen with some toys, and his reactions when unable to reach a toy. At 2 years the only test employed is taken from the Griffiths speech scale, and consists of naming or identifying pictures and small toys. Throughout the two-year interview, however, which commonly takes one and a half hours, the child is allowed to play in the interviewing room with certain standard play apparatus. Note is taken of his main forms of play, of the length of time he plays without seeking attention, of the manner in which he seeks it, and of his utterances.

Rating Scales.—The child's behaviour during the interview, test, and/or standard situations is used as a basis for rating a number of personality variables, selected on the basis of experience in the pilot study. This permits the comparison of one child, or group of children, with others of the same age in a roughly quantitative fashion. The repeated ratings will also be of value in estimating the constancy or otherwise of particular personality traits, and the extent to which personality patterns are affected by the family background and general environment. Seven of the variables are also rated during the physical examination by the assistant, who also notes the frequency of the child's smiling and crying. This permits of a comparison of the behaviour of the same child in two very different types of situation. For each variable, five categories are defined as concretely as possible so as to maximize approximation to a common standard on the part of several raters.

Check Lists.—These consist of a list of characteristics of the child and factors in the life of the family which may occasion the mother pleasure, anxiety, or displeasure. Any such feelings clearly demonstrated by the mother are noted on the list after each interview. It is thus possible on the basis of repeated interviews to pick out her consistent and changing preoccupations. An identical list is filled in by the assistant, who is present at all the physical examinations, where particular anxieties about the health and welfare of the child may be expressed.

(*b*) *Physical Session.*—The duration of this is from 25 to 35 minutes, and includes a number of aspects.

(i) A personal *photograph* is taken of the mother and child. An enlarged copy of this is given to the mother at her next visit.

(ii) A *history* is taken of the child's health since the last visit, including feeding and appetite details, together with a note of injuries and inoculations. Should the child have been admitted to hospital, details are requested from the hospital concerned.

(iii) A comprehensive *clinical examination* is carried out by the paediatrician (usually the same one). Results are recorded on a detailed form so that personal bias and interest for one body-system over another is unlikely to affect the result should another paediatrician carry out the examination.

(iv) The child is *measured anthropometrically* by one of two practised measurers. It is hoped that to keep errors at a minimum the number of different anthropometrists over the years will be very small. So far four trained persons have been involved. To check on the extent of such errors, reliability tests are carried out from time to time. The routine measurements themselves number 13. These are height (or lying height), sitting height (or occiput–coccyx length), weight, hip width, biacromial width in older children, two measures between rigid bony points, two circumferences of limbs, and four subcutaneous tissue measurements. These measurements are designed to show the growth of the body as a whole, the general body type, and the growth of muscle, fat, and bone proportionately.

(v) A *radiograph* of the *left wrist* is taken and the skeletal age estimated from an atlas of standards (Greulich and Pyle, 1950).

(vi) A special *radiograph* is taken of the *calf*. From this may be calculated mathematically the tissue proportions of the limb—that is, muscle, fat, and bone (Falkner and Wisdom, 1952).

(vii) *Colour of hair and eye* are assessed by comparison with standards. Actual specimens of hair are obtained from the older children for the Department of Anthropology, University College, London, who are making a detailed study of this factor, using an accurate spectroscopic technique.

(viii) *Future Methods.*—Placing an individual in certain categories of body type is known as *somatotyping*. This is a photographic method of body measurement which determines body type by ascertaining the degree of endomorphy, mesomorphy, and ectomorphy present (Sheldon, 1940). Accurate posing of a co-operative individual in three standard standing positions is needed, and, naturally, this is not possible with infants and younger children. Work is in progress to try to devise a method of placing these groups into some form of body-type classification. This is being attempted by research into methods of finding the volume and surface area of these children by stereophotographic and physical means. As a part of this research, routine measurements of the *volumes of hands and feet* are carried out on all children in the sample.

Somatotyping itself is in progress on a small longitudinal growth study of volunteer healthy pre-adolescent and adolescent boys from the City of London School, and on the pilot group. The children from the main sample will be somatotyped at an age when they are co-operative enough.

Some Problems of Investigating Physical Growth

The *nutritional status* of a child can be assessed in three major ways. We are employing (*a*) the history, which may reveal extremes of nutritional background, coupled with a paediatric clinical assessment; and (*b*) an assessment derived from the socio-economic background. The third method, that of recording the food intake and its calorie value, has immense practical difficulties. Mere questioning of the mother fails to ascertain amounts of food, or the effects of cooking, while completion of diet charts by the mother is likely to influence her choice of foods.

Genetic influences are also of cardinal importance. It would be ideal to somatotype the parents, but it might well be impossible to obtain the consent of a representative sample to this proposal. It is planned, however, to measure the parents and any mature siblings at a later date, when the families are better known.

Physiology.—For practical reasons we are not able to carry out detailed physiological or endocrine-function investigations, the main difficulties being lack of personnel and laboratory facilities, and the obvious likelihood of parental objection to the taking of specimens from the children.

Interpretation of Physical Data.—It is recognized that the measuring of "abnormal" and "normal" with regard to physical growth is an unsettled problem and difficult indeed

to define. Together with others engaged on this type of work, we are attempting to simplify this problem by continuing the search for a satisfactory basis on which to record and interpret our data.

Some Problems of Investigating Personality Development

The first problem on the psychological side of the research was to decide on the scope of the inquiry. Which of the many facets of personality should we study, and which of the environmental influences upon it?

"Mental development" is often taken to imply the complex of growth processes measured by the developmental tests of Gesell (Gesell and Amatruda, 1947), Bühler (Bühler and Hetzer, 1935), and others, centring on the maturation of various skills, and having, therefore, a strong cognitive bias. Since this aspect of development has already been studied in considerable detail in many other places (see Maurer, 1946, pp. 13–18 for list of references) it was decided to concentrate rather on the orectic side of personality—the emotional characteristics, social behaviour, and personal relationships, which differentiate children in another dimension, though they, too, are subject to developmental principles. Developmental tests are used in this research as a yardstick of general maturity, viewed as one important dimension of the child's individuality at a given age, to be related to other, less well charted, dimensions.

For example, the development of such skills as locomotion, speech, and manipulative abilities depends to an important extent on such personality characteristics as strength of drive and attitude. It also depends on opportunities for learning. Both opportunity for learning and personality development are partly determined by the relationship the child makes with his parents and siblings in a particular social context. The development of skills in its turn modifies the child's environment, bringing fresh activities within his reach, and calling out new responses from those around him. In the same way, a child's responses to feeding, toileting, and going to bed can be seen, on the one hand, as a product of his maturity, health, temperament, and earlier experiences, and, on the other hand, as a condition of his subsequent health and personal adjustment, affecting his relationships with his parents in important ways.

In order to study the interconnexions between these factors, for most of which no standard method of assessment exists, we have had to forge our own research tools. In designing the interviews and observational techniques described in the foregoing sections we have sought to include as many as possible of those aspects of experience and behaviour which are easily observed, fairly objectively described, and generally thought to be of importance for later personality. In this process of selecting the questions to be asked, two of us, the research psychologists, have drawn extensively on the literature of developmental psychology, psycho-analysis, and learning theory; on our personal experience as fathers; and on the experience gained in the pilot study. As the children attain each fresh stage of development, the search for hypotheses linking that stage with later life is taken up anew, and fresh interviews and situations are designed to investigate them.

Owing to the great number of variables involved in human behaviour, the testing of hypotheses in psychology often presents a complicated problem. In this research the experimental control of variables was renounced in line with the policy of non-interference. This leaves us with two possible ways of testing a hypothesis: (*a*) the statistical study of groups, and (*b*) the intensive study of individuals. By the former approach we can establish the mathematical probabilities of a connexion between variables, but the dynamics of the connexion tend to remain obscure. By the case-study approach we can gain added insight into the dynamic processes at work, and can see the operation of many factors in their context, but can never generalize beyond the one case, since the pattern of variables is never reduplicated.

Suppose, for example, that 60 out of 100 children who were frequently spanked were found to be spiteful to younger siblings or pets, whereas only 20 out of 100 unspanked children showed spite, we might safely infer a significant connexion. But in how many cases did spanking lead to spite, and in how many vice versa? Why were the 20 unspanked children spiteful, and why not the remaining 40 of those spanked? More light on these questions can be gained by examining the individual case records, and more still if there is an opportunity to watch a few of the children in the actual situation. Even then the answers will be partial and qualified; but they will be in terms of the concrete actions of real children. Moreover, in the process, other hypotheses may well have been thrown up for further statistical investigation.

Our programme therefore envisages intensive observation of a limited number of individual children, running concurrently with the larger sample study in a complementary relationship, each continually feeding the other with new ideas. To what extent this will prove feasible depends on funds available.

Of course the methods appropriate to the two types of approach differ in many important respects. It was not fully realized at the outset of this research that the two main functions of the pilot study were to some extent incompatible. On the one hand, it had to be used for clarifying basic concepts, and for suggesting hypotheses to be tested on the larger sample; for this purpose it had to be an intensive study of a few individual children in their family settings—as vivid, concrete, and personal as possible. On the other hand, it was intended for use in trying out the methods to be employed on the larger investigation; but here, although much was learnt about techniques of interviewing, testing, rating, etc., there was much more that could be discovered only through the actual experience of a large sample study.

In general, whereas freer methods are appropriate to the individual case, a more standardized approach is essential for larger numbers. In interviewing mothers, for example, it was desirable, for exploratory purposes, to allow them to talk spontaneously, with few set questions, provided only that the main headings were covered. For statistical purposes, however, it was quite essential that exactly comparable information should be obtained on each child so far as was possible, and this necessitated an oral questionary at each age, which, it was found, had to be constantly amended in the direction of greater exactness to ensure that different interviewers would obtain equivalent information. Again, in the pilot study, relatively free play situations were used in order to explore the variety of children's play and social behaviour at each age. With the larger numbers, however, any neglect to standardize the situation (within practicable limits) would have led to spurious comparisons between children, and to faulty conclusions. In short, the more children one studies, man-power being constant, the less frequently one can see them. The less frequently one sees them, the fewer the chances of correcting errors in the data, and the more important it becomes to ensure that one's methods have maximum reliability.

Since much of our information must necessarily be derived from mothers' testimony, and since the behaviour of children is notoriously variable, it is of particular importance to estimate the amount of error involved in our methods. Attempts are therefore being made to assess the accuracy of mothers' testimony, and the consistency of our observational techniques. This will be the subject of a later report.

The study has had the great advantage of specialized advice, encouragement, and much help since its conception from many people. From among these we are particularly grateful to the following: Dr. Mildred Creak, consultant psychiatrist, the Hospital for Sick Children, Great Ormond Street; Dr. D. Geffen, medical officer of health, St. Pancras; Dr. Ruth Griffiths, educational psychologist; Dr. T. H. Hills, director of radiology, Guy's Hospital; Professor R. A. McCance, professor of experimental medicine, University of Cambridge; Dr. E. A. Miskin, director of civil engineering, University College; Dr. J. A. Fraser Roberts,

the London School of Tropical Medicine and Hygiene; Dr. A. B. Stewart, late Divisional Medical Officer, the London County Council; Dr. J. M. Tanner, The Sherrington School of Physiology, St. Thomas's Hospital; Professor P. E. Vernon, Professor of Psychology, London University, Institute of Education; Mrs. J. M. Williams, lately child psychologist, The Hospital for Sick Children, Great Ormond Street. The study would not have been possible without the continued help and co-operation of staffs of the local hospitals, authorities, and midwives, of a number of voluntary assistants, and of the mothers and children concerned, who have given generously of their time and effort. We are indebted to the Nuffield Foundation for a grant towards initial capital expenditure. The cost of this research project is shared between the Institute of Education and the Institute of Child Health of the University of London.

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SIX CASES OF CARCINOMA OF THE OESOPHAGUS OCCURRING IN ONE FAMILY

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The great majority of cases of cancer met with in routine practice seem to occur sporadically and to have no obvious environmental or hereditary basis. This is true of carcinoma of the oesophagus, because, although factors such as sex, occupation, habits, and economic status may predispose to the neoplasm, the fundamental causes are unknown and all that can be said is that the disease is likely to be the result of a complex interaction between inherited and environmental factors. In the family to be described, in which there were six deaths in two generations from carcinoma of the oesophagus, it seems probable that a genetic factor was primarily responsible. The pedigree is reported in the hope that an investigation of similar families may throw light on the circumstances in which the disease may be inherited.

It is appreciated that data such as this may be very misleading, because a high familial incidence of cancer can be due to chance and will occur in any large series (Gorer, 1953). Nevertheless, it seems worth while investigating fully a family such as this, particularly as the oesophagus is a relatively rare site for carcinoma. The Registrar-General gives the following figures for 1952:

	Male	Female
All malignant neoplasms ..	45,429 ..	42,213
Digestive organs and peritoneum	20,175 ..	18,403
Oesophagus	1,475 ..	850

The family concentration is thus the more remarkable, and, as the evidence is in favour of an inherited rather than a fortuitous or environmental origin, it seems relevant to try to find out why particular members were affected and others remained free. Linkage studies may be of use for this purpose, and an investigation of the ABO blood groups has been carried out in as many as possible of the patients and their relatives. In this we were prompted by the recent finding of the statistically significant association between blood group A and carcinoma of the stomach (Aird *et al.*, 1953). In any future study involving a forward survey of similar families a complete investigation of the blood groups and other inherited traits would be well worth carrying out. This matter is referred to again later.

Comments

1. It will be seen from the pedigree that in generation II, three out of six, and in III, three out of eight siblings were affected by the disease. These figures are not significantly different from the 1:1 ratio that would be expected if the carcinoma were due to a single dominant gene present in the heterozygous state in I 1 or I 2 but failing to find expression in that generation. An alternative explanation is that the gene arose as a mutation early in the development of the gonads of I 1 or I 2. The fact that three individuals (II 7, III 1, and III 7) died at a rather early age does not materially affect the above hypothesis.

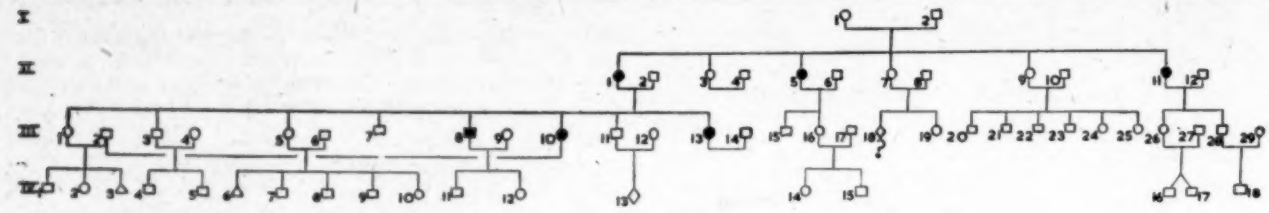
2. The pedigree also shows that in each generation those who were affected died at approximately the same age: in addition, those in the second cancer generation (III) contracted the disease much earlier.

3. In three of the cases (II 11, III 8, and III 13) the site of the cancer is known with certainty to have been at the lower end of the oesophagus. In one (III 10) the growth was in the upper third (but did not originate in the hypopharynx). In one (II 5), the symptoms suggest that it was in the mid- or lower zone, and in one (II 1) the site is not known. In the three cases (II 11, III 10, and III 13) in which the histology is known the growth was a squamous-cell carcinoma.

Cancer of the mid- and lower oesophagus is much more prevalent in men than in women (8:1, Price, 1950) and the disease is commoner among commercial travellers, barmen, and waiters than among those engaged in other trades: to explain this it has been suggested that the oesophagitis produced by alcohol and tobacco in association with a poor diet may be a predisposing factor.

An attempt has been made to assess the habits and environment of the present family. None of them was engaged in any alcoholic trade and in none was there any history of excessive smoking or alcoholism. An idea of the circumstances in which generation II lived has been obtained by visiting the house in which they were brought up and which is still occupied by II 12, III 28, and III 29, and IV 18. No adverse features were noted, the food being good, the house clean, and the economic status of the family very satisfactory. Thus the usually stressed exogenous factors are not apparent in the first cancer generation. It will be seen that this consisted entirely of women, and the proportion affected is explained on the genetic theory.

The transmitter (II 1) of the disease to the next generation married a man who died of pulmonary tuberculosis, and their environment and social status were very poor and the house in which they lived and reared their family is condemned. Their two affected daughters (III 10 and 13) continued to live there after they were married and until they died. Whether the decline in economic status of this branch of the family had anything to do with the continuance of the cancer is speculative, but it is known that the poorer classes show a greater proportionate death rate from oesophageal cancer than do the higher-income groups (Clemmesen, 1951). The offspring (III 16) of the



Key to Pedigree

(NOTE: Those individuals about whom no information has been obtained have been omitted from the key.)

I 1. Born 1856. Died in 1926, aged 70, of rheumatic endocarditis. No blood relation to her husband.
I 2. Born 1852. Died in 1915, aged 63, of cardiac disease and renal coma.
II 1. *Born* 1882. *Died in* 1935, *aged* 53, *of cancer of the oesophagus. No post-mortem examination. Blood group not known.*
II 2. Died, aged 63, of pulmonary tuberculosis.
II 3. Died about 1932 ? from rheumatoid arthritis.
II 5. *Born* 1885. *Died in* 1934, *aged* 49, *of cancer of the oesophagus, following gastrostomy. Blood group not stated in hospital records. No post-mortem examination.*
II 6. Born 1879. Died in 1923, aged 44, from chronic bronchitis and myocardial degeneration. Occupation window cleaner.
II 7. Born 1889. Died in 1913, aged 24, of toxaemia of pregnancy.
II 9. Alive and well, aged about 62.
II 11. *Born* 1894. *Died in* 1951, *aged* 57, *of carcinoma of the oesophagus. Post-mortem examination showed squamous-cell carcinoma 6 cm. long starting 5 cm. above the cardia. No secondaries noted. Blood group A.*
II 12. Aged 63, suffers from bronchitis, otherwise well. *Blood group A, Rhesus positive.* No consanguinity with wife. His mother died of cancer, type unknown.
III 1. Died in childbirth. No other details known.
III 3. Born 1903. Alive and well apart from "rheumatism." *Blood group B, rhesus positive.*
III 5. Born 1905. Hypertensive, B.P. 200/110. *Blood group O.*
III 6. Born 1891. Died in 1949, aged 58, from emphysema.
III 7. Born 1908. Died in 1933, aged 25, from cerebral haemorrhage.
III 8. *Born* 1910. *Died in* 1947, *aged* 37, *of carcinoma of the oesophagus. Type of growth not known but oesophagoscopy showed ulcerating carcinoma 34 cm. from upper front teeth. X-ray examination showed obstruction to be in the lower third of the oesophagus. No post-mortem examination. Blood group B.*
III 9. Alive and well.
III 10. *Born* 1913. *Died in* 1945, *aged* 32, *of carcinoma of the oesophagus. Oesophagoscopy showed growth to be 15 cm. from incisor teeth and x-ray examination demonstrated obstruction to be at level of second and third dorsal vertebrae. Snippet showed rather poorly differentiated squamous-cell carcinoma. No post-mortem examination. Blood group not known.*
III 11. Born 1920. Alive and well.
III 13. *Born* 1922. *Died in* 1951, *aged* 29, *of carcinoma of the oesophagus. Post-mortem examination showed the entire lower third of the oesophagus to have been completely destroyed by necrotic malignant tissue. Malignant change extended into the stomach for about 2 cm. distal to the cardiac orifice. Secondary deposit in the upper pole of the left kidney. Histology of oesophagus showed squamous-cell epithelioma and that of the tumour deposit in the upper pole of the left kidney a keratinizing squamous epithelioma. Blood group not known.*
III 14. Alive and well.
III 15. Born 1914. Alive and well.
III 16. Born 1915. Alive and well. *Blood group B. rhesus positive.*
III 17. Alive and well.
III 19. Died in childhood.
III 20–25. Alive and well.
III 26. Born 1921. Alive and well. *Blood group A, rhesus positive. Non-secretor.*
III 28. Born 1925. Alive and well. *Blood group A, rhesus positive.*
III 29. Alive and well. *Blood group O. Rhesus positive.*
IV 1 and 2. Alive and well.
IV 3. Died at birth.
IV 4 and 5. Alive and well.
IV 6. Stillborn.
IV 7. Died of meningitis in childhood.
IV 8. Born 1932. Has elephantiasis of the legs. } Family history of this
IV 9. Born 1933. Has elephantiasis of the legs. } on paternal side.
IV 10. Born 1939. Alive and well.
IV 11. Died in childhood.
IV 12. Born 1941. Alive and well.
IV 14. Born 1938. Alive and well. *Blood group B, rhesus positive.*
IV 15. Born 1949. Alive and well.
IV 16. Alive and well. Identical twin; born 1949. *Blood group O, rhesus negative. Non-secretor.*
IV 17. Alive and well. Identical twin; born 1949.
IV 18. Aged 4 months. Alive and well.

third affected sister (II 5) also lives in poor circumstances and has indifferent dietetic habits. As she is at risk genetically it will be especially interesting to see if she develops the disease.

4. The possibility that a gene responsible for the cancer might have been linked with one of the ABO blood groups has been investigated. It will be seen (*a*) that two of the patients with the cancer had different blood groups; II 11 was group A, and III 8 was group B; (*b*) that III 3, who, because of his age as compared with his affected siblings, may be no longer at risk, has a similar blood group (group B) to his brother who died of the disease.

These data are meagre, and all that can be said is that in this family the presumed gene determining the cancer has not been completely linked in transmission with one of the ABO genes.

The question of linkage when carrying out further family studies has been considered, and it is important that tests used should give clear-cut results. The following investigations appear suitable, and we are indebted to Professor L. S. Penrose for his advice on the matter: (*a*) the blood groups; (*b*) the ability to secrete blood antigen in the saliva; (*c*) the ability to taste phenyl thiourea; (*d*) fingerprints; (*e*) cephalic index; and (*f*) red-green colour vision and sex.

5. The hypothesis that the cancer is due to a single dominant gene is consistent with the facts and is by far the most likely explanation if further cases occur either in the third generation or in the offspring of II 5 or 11. Five individuals (III 15, 16, 26, 28, and IV 12) appear to be particularly at risk, and of these the first four need to be kept under close observation, since they are now of approximately the same age as their cousins were when they developed the disease. If the genetic theory is correct then there is less than a 20:1 chance that one or more of the five will not contract the disease.

The forward survey of the family will be of much interest in the light of the genetic and environmental information which has been obtained up to the present time.

A possible analogy with multiple polyposis of the colon and rectum suggests itself (Dukes, 1952), and perhaps what is inherited in this family is a precancerous condition of the oesophagus.

Summary

A pedigree showing six cases of carcinoma of the oesophagus in two generations is described. Reasons are given for thinking that in this family the disease may have been due to a single dominant gene. The possible part played by environmental factors is discussed. It is hoped that others will report any similar observations, since pooled information on families might be of great value in determining the factors responsible for the disease.

We are grateful to Dr. W. W. Newman and Dr. A. Stone for their help in giving us details of the families and for enabling us to interview relatives of those affected. We are also indebted to Dr. P. M. Sheppard for advice on the genetic aspects of the paper.

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Among the conclusions on the epidemiology of non-gonococcal urethritis reached at a recent symposium in Monaco, arranged by the International Union against the Venereal Diseases and Treponematoses, were the following: The prevalence of the disease is tending to approach, if not exceed, that of gonorrhoea. Its incidence is unaffected by race, geographical location, season of the year, or age and sexual habits of the patient. Although its incubation period has not been fixed definitely, it is longer than in gonorrhoea. Allergy seems to play no part in its causation, though ill-considered local treatment may do so. Examples of case-to-case infection have been observed.

THE FAMILIAL OCCURRENCE OF ANKYLOSING SPONDYLITIS

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This paper reports a family in which three brothers, one sister, and a paternal uncle suffered from ankylosing spondylitis, and discusses the importance of heredity in this condition.

Although von Becterew and Marie described families with multiple cases of spondylitis, many observers since have believed that there was no familial predisposition in this disease. Llewellyn Jones (1909) said that hereditary transmission was extremely rare. Dunham and Kautz (1941) and Stone, as recently as 1947, made no reference to heredity in the aetiology of ankylosing spondylitis. MacWhirter (1945) stated that the disease may sometimes be familial. Simpson and Stevenson (1949), in an analysis of 200 cases, found a positive family history in only two patients—that is, a familial incidence of 1%. Campbell (1947), in reporting 25 cases of ankylosing spondylitis, mentioned four families in which multiple cases of the disease had occurred, and said that "the family history is significant and inadequately emphasized in the English literature." Stecher and Hauser (1946) reported four instances of ankylosing spondylitis affecting brothers, but were "forced to conclude . . . such a coincidence may have resulted from chance alone." In 1952, however, Stecher reported 59 families with more than one person suffering from the disease, and stated that the incidence of ankylosing spondylitis in relatives of patients was 30 times that of controls. Families have also been reported by Ray (1931–2), Stauffer and Moffett (1946), Tegner and Lloyd (1949), Fraser (1950), and Riecker *et al.* (1950); the last-mentioned authors thought that transmission was probably due to an autosomal dominant gene. Hersh *et al.* (1950), in a study of 50 families of ankylosing spondylitis, concluded that "there can no longer be any reasonable doubt that heredity plays a major role in the aetiology of spondylitis."

Case Reports

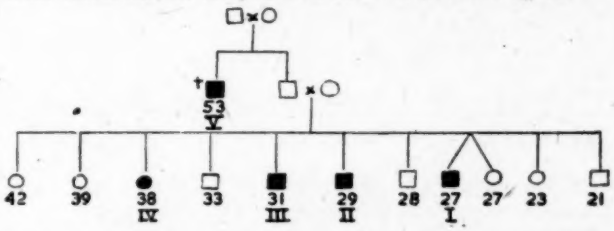
Case I.—A man of 27 had in 1946, when aged 18, suffered from an attack of low back pain which was treated with physiotherapy and went within a few weeks. He remained well until 1953, when he began to develop pain and stiffness in his cervical and dorsal spine, which gradually increased in severity. He had lost 21 lb. (9.5 kg.) in weight over the previous year. Examination revealed a generalized stiffness of his spine, most marked in the cervical region, and he could not reach within 16 in. (40.6 cm.) of his toes. His chest expansion was ¼ in. (6 mm.). His haemoglobin was 13.7 g. per 100 ml.; sedimentation rate (Westergren), 20 mm. at one hour. *X*-ray examination showed: chest normal; early ligamentous calcification of cervical spine; erosions and sclerosis on the left sacro-iliac joint, the right side appearing within normal limits.

Case II.—A male aged 29 was first seen in 1947, when aged 22, complaining of pain at the base of his spine of three months' duration. The pain was worse in bed at night and was relieved by getting up and walking. On examination he was tender over the sacro-coccygeal junction; the diagnosis at first was "coccydynia." *X*-ray examination of the sacro-iliac joints showed some obliteration of the joint space and surrounding bone sclerosis.

Case III.—A male aged 31 suffered in 1944, when aged 20, from pain in his ankles which was thought to be due to rheumatoid arthritis. This pain disappeared after four months, and he remained well until 1952, when he complained of low backache, which persisted. He later developed pain between his scapulae, and his cervical spine became stiff. He had not noticed any loss of weight. Examination in December, 1953, showed limitation of all movements of the cervical spine, kyphosis of the dorsal spine, and limitation of flexion of the lumbar spine. He was not able to reach within 12 in. (30 cm.) of his toes. His chest expansion was ¼ in. (1.3 cm.). His haemoglobin was 8.9 g. per 100 ml.; sedimentation rate (Westergren), 20 mm. at one hour. *X*-ray examination: chest normal; dorsal spine showed marked kyphosis, squaring of the bodies, and calcification of the ligaments in the D 11 area; sacro-iliac joints showed marked erosions with partial obliteration of the left joint space.

Case IV.—A woman aged 38 developed psoriasis in 1929, when aged 11. At the age of 25 she complained of vague backache following the birth of her first child. For the past three years the pain in the lower lumbar area had become more severe, with increasing limitation of movement. More recently her right hip and shoulder had become painful. Examination revealed dorsal kyphosis, lumbar lordosis, and limitation of movement of the lumbar spine, and she could not reach within 4 in. (10 cm.) of her toes. Her chest expansion was 2 in. (5 cm.). Her haemoglobin was 13.9 g. per 100 ml.; sedimentation rate (Westergren), 31 mm. at one hour. *X*-ray examination: spine showed squaring of mid-dorsal vertebrae; sacro-iliac joints revealed irregularity and sclerosis.

Case V.—A male aged 53 was diagnosed elsewhere in 1940 as a case of ankylosing spondylitis. He died in 1951 from carcinoma of the pancreas and was not seen by us.



Pedigree of the family. □=Normal male. ○=Normal female. ■=Male with ankylosing spondylitis. ●=Female with ankylosing spondylitis. †=deceased. Arabic numerals give ages in years; Roman numerals indicate cases referred to in the text.

Discussion

West (1948), in a study at Bristol, found a familial incidence in ankylosing spondylitis of approximately 11%. In the same year Rogoff and Freyberg read a paper at the Annual Congress of the American Rheumatism Association and reported a series of 114 patients suffering from ankylosing spondylitis, and in 10 of these cases one or more relatives had the disease; they concluded that the familial incidence was 9–13%. Talkov (1948), in the discussion that followed, said that the familial incidence was less in those patients in whom the peripheral joints were involved. Polley, at the same meeting, reported a family of three brothers and a sister all affected with the disease, but he found a family history in only 0.4% of his cases, and thought that factors other than heredity were more significant in the aetiology. Rosenberg (1948) stated that he now urged radiographic examination of all male siblings of spondylitis patients, and by this means he had discovered five cases in a year. From a survey of case notes of 100 patients with ankylosing spondylitis who attended the Royal Free Hospital, six were found in whom one or more relatives were affected with the same disease. The familial incidence, therefore, is at least 6%.

Since the onset of ankylosing spondylitis is extremely variable, and as the average interval between the first symptoms and diagnosis is three to four years, it is advisable to *x*-ray the sacro-iliac joints in siblings of patients with this disease, and imperative in any relative who complains of pain referable to the locomotor system.

Summary

A family in which five members had ankylosing spondylitis is reported.

The familial incidence is discussed and its importance emphasized.

Radiography of sacro-iliac joints is advised in relatives of patients with ankylosing spondylitis who complain of symptoms referable to the locomotor system.

We wish to thank Mr. Radley Smith for referring those cases which we originally saw; Dr. Ernest Fletcher, under whose care they were admitted; and the Board of Governors of the Royal Free Hospital.

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ACUTE DIFFUSE LUPUS ERYTHEMATOSUS

REPORT OF A CASE WITH PREDOMINANT PULMONARY MANIFESTATIONS

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The demonstration of "L.E." cells by Hargraves *et al.* (1948) has considerably broadened the clinical concept of acute disseminated lupus erythematosus. Pulmonary involvement in the collagenoses is by no means uncommon, but it is not widely recognized that in the condition under discussion the pulmonary manifestations may overshadow the more classical features—namely, rash, polyarthritis, polyserositis, adenopathy, splenomegaly, and nephritis. Rakov and Taylor (1942) first described such a case. Israel (1953), recording 22 cases of diffuse lupus, found pulmonary involvement the predominant feature in two. Rapaport *et al.* (1953) described two cases with pulmonary lesions. Their Case 1 is strikingly similar to that cited below, and is another example in which the pulmonary manifestations were the presenting feature. Diagnostic difficulties were experienced until "L.E." cells were demonstrated in the peripheral blood.

Case History

A 39-year-old tool-fitter returning home from work in mid-June, 1953, became extremely fatigued and noticed retrosternal soreness. Fever, dyspnoea, and a productive cough rapidly developed. His doctor treated him with penicillin and sulphonamides with no improvement, and on July 2 he was admitted to hospital. On admission, fever, tachycardia, finger-clubbing, signs of consolidation over the left lower lobe and a systolic murmur at the cardiac apex were present. His blood pressure was 115/70. Examination of other systems revealed no abnormalities.

Investigations.—Radiology: Chest *x*-ray examination (July 2) showed radiological changes of left lower lobe consolidation; barium swallow was normal; bronchography (July 31) revealed minimal dilatation of left posterior basal bronchi. Sputum: microscopy showed pus cells with no predominant organism or acid-fast bacilli; cultures were without significant result. Urine: trace of albumin, no sugar; microscopy showed no casts or red blood cells; cultures were sterile. Blood count (July 28): Hb, 11.6 g.% Haldane; white cells, 12,000 per c.mm. (neutrophils 87%, eosinophils 2%, basophils nil, lymphocytes 10%, monocytes 1%). Widal reactions were negative. E.C.G.: regular sinus tachycardia (120 per minute), with RST depression and inverted T waves in left precordial leads.

Progress.—Parenteral penicillin was given with an initial fall in temperature, but within a week, while he was still on this treatment, fever recurred. Chloramphenicol, 2 g. daily, and later intramuscular streptomycin, 1 g. daily, were in turn substituted for penicillin. These produced the same pattern of response. Meanwhile the patient's condition deteriorated. He lost weight, the retrosternal soreness increased, and the finger-clubbing was more pronounced. Paradoxically the abnormal pulmonary physical signs disappeared. A further chest *x*-ray examination (July 9) showed considerable clearing of the left base, with pleural thickening in both costophrenic angles. Bronchoscopy on August 14 showed a small quantity of pus in the left main bronchus; there was no evidence of neoplasm. On August 22 he was transferred to this hospital. By now he was thin, sallow, and dyspnoeic, and complained bitterly of retrosternal pain. Fever persisted, finger-clubbing was still present, splinter nail haemorrhages and subconjunctival petechiae had appeared. There was no splenomegaly, lymphadenopathy, oedema, or cyanosis. The signs in the lungs were now those of partial collapse of the left lower lobe with some fluid. The heart was as previously described.

Further Investigations.—Blood count: Hb, 10.1 g.% (Haldane); white cells 9,000 per c.mm., the differential count showed a few metamyelocytes; platelets, 300,000 per c.mm.; M.C.V., 84 μ^3; M.C.H.C., 30%. E.S.R. (Westergren): 90 mm./hour. Virus studies for influenza A+B, Q fever, psittacosis-L.G.V., and *Streptococcus M.G.* were all negative. Urine: a few hyalo-epithelial and granular casts with an occasional red blood cell; cultures produced no significant pathogens. Blood urea and plasma proteins were normal. The sternal marrow showed increased cellularity with myeloid hyperplasia; it was sterile on culture. The pleural fluid was clear and straw-coloured; it contained polymorphs 50%, lymphocytes 42%, and monocytes 8%; no malignant cells were seen; cultures, including those for tubercle, were sterile.

By September 14 his condition was critical. In addition to the petechial haemorrhages previously recorded, a scaly papular haemorrhagic rash was noted over the trunk. A skin biopsy showed changes which were not thought to be diagnostic. (These changes are discussed below.) At this stage the possibility of subacute bacterial endocarditis was seriously considered despite negative blood cultures. Accordingly penicillin, 12,000,000 units daily, was given. As before, there was an initial decrease in pyrexia but with a subsequent rise. Three weeks later oxytetracycline 2 g. daily was substituted for penicillin and continued for six weeks, again without obvious result.

On September 24, about five months after the onset of his illness, "L.E." cells were found in the peripheral blood. The possibility that these were penicillin-induced (Walsh and Zimmerman, 1953) was seriously considered but rejected on the following grounds: (1) the clinical course of the illness, and (2) re-examination of the stained section of skin biopsy (taken before high-dosage penicillin was given) was considered to show some early characteristics consistent with those found in diffuse lupus erythematosus.

The diagnosis was now evident, and efforts to control the disease with A.C.T.H. were begun on October 10. A prompt fall in temperature ensued, together with clinical improvement. Oedema necessitated the stopping of A.C.T.H. on October 19, and immediate relapse resulted. Resumption of A.C.T.H. was followed by remission.

Since the patient continued to improve, domiciliary maintenance with corticoids was decided on. Accordingly cortisone by mouth was substituted for A.C.T.H. He was discharged on December 24, taking 50 mg. of cortisone acetate daily. Out-patient follow-up showed maintained improvement, but with dyspnoea, tachycardia, and some collapse at the left base. Finger-clubbing persisted, and "L.E." cells were still demonstrable in the peripheral blood.

Discussion

Pulmonary involvement in diffuse lupus erythematosus is more commonly the result of secondary bacterial invasion, as may be seen in many extremely debilitating illnesses. These lesions are usually lobar or lobular in distribution and respond to adequate antibiotic measures. Miliary tuberculosis has been described as an occasional terminal event.

However, specific pulmonary lesions have been reported. Teilum (1946) described a "focal allergic pneumonia" which may be present throughout the lung but is more often subpleural. Microscopically he found a fibrinoid necrosis with histiocytic infiltration of the connective tissue and capillary walls of the alveolar septa. With less pronounced necrosis there is a tendency towards organization and fibrosis. Nevertheless, Foldes (1946) described a case of massive fibrosis with alveolar obliteration which he named "primary atelectasing pneumonitis." Presumably, despite Teilum's contention, the lesions may be either focal or diffuse. Baggenstoss (1952) described a basophilic mucinous oedema of the alveolar wall together with peribronchial and perivascular tissues. He suggested that the alveolar wall oedema was the precursor of the interstitial pneumonitis. Rakov and Taylor (1942), studying post-mortem material in their case, reported a chronic interstitial pneumonitis with atelectasis.

Thorell (1952) claimed that there are specific pulmonary radiological changes. These consist in mottling and streakiness, mainly subpleural and more marked at the bases; there was usually pleural thickening, often with small pleural effusions. However, pulmonary lesions similar to those described above have been reported in a wide variety of conditions. These include protein hypersensitivity, acute glomerulonephritis, rheumatic pneumonitis, dermatomyositis, scleroderma, and rheumatoid arthritis, as well as acute diffuse lupus erythematosus. Sante and Wyatt (1951) grouped these similar pulmonary lesions under the term "antigenic pneumonitis," pointing out that their common denominator is the involvement of connective tissue. Barden and Cooper (1948), discussing the pulmonary radiological findings in this group of diverse but probably related conditions, laid emphasis on increased permeability of vessel walls as a cause for the *x*-ray signs. They described characteristic radiological patterns resulting from patchy or massive pulmonary oedema. The usual appearance, according to them, is that of massive fluffy shadows extending outwards from each hilus in a symmetrical fashion, the periphery of these shadows blending with the adjacent aerated lung. In less severe cases they described scattered subpleural shadows, again without definite margins. These may rapidly enlarge and merge.

In our case the fluctuating nature of the pulmonary lesions was noticeable, the signs varying first on the left and then from side to side. In general, the radiological picture accords with Thorell's description except that partial collapse of the left lower lobe was a prominent feature in this instance. Unlike Thorell, we feel some doubt about the specificity of the radiological signs in disseminated lupus, but we agreed that where obscure, diffuse, or fluctuating radiological signs are observed in the course of an otherwise unexplained illness the possibility that these are due to disseminated lupus should be seriously considered.

It is apparent that, although pulmonary involvement in diffuse lupus erythematosus may occur, it is very unusual for it to predominate, more especially so in the early phase of the disease. When it does, as in the case presented, diagnostic difficulties may arise. It is suggested that an examination for "L.E." cells be carried out in cases of pneumonia running an unexpectedly atypical or prolonged course.

Summary

An unusual case of acute diffuse lupus erythematosus is described in which the pulmonary manifestations were the predominating features.

The pulmonary pathology and radiological features of this condition are discussed and their relationship to the other collagenoses is briefly reviewed.

The value of examination for "L.E." cells in unusual pneumonias is mentioned.

We should like to thank Dr. R. L. Mackay for giving us details of the early stage of the illness. To Dr. D. R. Humphreys we are grateful for help and permission to publish.

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DIFFUSE SARCOIDOSIS ASSOCIATED WITH HYPOPITUITARISM AND TERMINAL RENAL FAILURE

BY

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Sarcoidosis is being increasingly recognized as a disease of protean clinical manifestations and widespread distribution in the body. The organs most often attacked are the lungs, lymph nodes, skin, spleen, liver, and eye. As the pituitary is rarely involved, the following record is presented of a patient who, after showing for many years the signs and symptoms of hypopituitarism and dying from renal failure, was found at necropsy to have widespread sarcoidosis.

Case History

A man aged 52, given as retired, but occupation not known, first attended the out-patient department of this hospital on June 13, 1949. He gave a history of ill-health extending over many years. It first began 15 years previously, when he had an attack of vomiting green fluid, lasting about three weeks. This was followed by loss of hair

from the axillae, pubes, legs, and eyebrows. In 1939 he suffered a loss of libido, and two years later began to complain of tiredness and listlessness. In 1945 he had one blood examination, and a diagnosis of pernicious anaemia was made, but the diagnosis was not supported by marrow puncture or a test meal. He was treated with liver, iron, and thyroid extract. In 1948 he had an illness described as "pneumonia." Apart from this he had been fairly well until about two months before attending this hospital, when he began to complain of loss of appetite and loss of weight. The past history held only one point, and this was an attack of probable erythema nodosum at the age of 11. The family history gave one brother dead from pulmonary tuberculosis.

On examination the patient's face and hands were pale and puffy, and he had a sandy freckled complexion. The pulse was regular, rate 72 a minute; the mucous membranes were pink; and the blood pressure was 200/115 mm. Hg. The optic fundi, heart, and lungs were normal. The tip of the spleen could be felt and there was slight pitting oedema of the legs. There was no axillary hair, and the pubic hair and eyebrows were very scanty. He was admitted to hospital on July 14, 1949.

Investigations.—Urine showed a cloud of albumin (Esbach consistently 0.25 to 1 g.); deposit and culture were negative except for a growth of streptococci on one occasion. Blood urea, 45 mg. per 100 ml.; plasma proteins, total 7.48 g.% (albumin 4.44 g., globulin 3.04 g.), A/G ratio, 1.4:1; blood cholesterol, 196 mg. per 100 ml.; haemoglobin, 84%; leucocyte count and differential normal; erythrocyte sedimentation rate (Wintrobe) 29 mm. in one hour; Wassermann reaction negative; intravenous pyelogram normal; basal metabolic rate −3%.

He ran a temperature of 101 to 102° F. (38.3 to 38.9° C.) for a few days following admission, but was discharged after a fortnight. He was given injections of testosterone, at first 25 mg. daily and later 100 mg. twice a week. A tentative diagnosis of chronic nephritis with endocrine dysfunction was made.

He attended as an out-patient, and in December, 1949, the spleen was easily palpable. The urine still contained albumin; also scanty red cells and leucocytes, and a moderate number of granular and hyaline casts.

Until April, 1951, he remained very well; it was then noted that the hair in the axillae and pubes had to a certain extent returned, and he stated that he was no longer impotent. The blood urea was 39 mg. per 100 ml.

On June 29 he was readmitted, giving a history of anorexia, vomiting, increasing weakness, and loss of weight of two months' duration. On examination it was found that the blood pressure had fallen to 125/80 mm. Hg, and he was obviously ill. The blood urea had risen to 168 mg. per 100 ml., and the albumin–globulin ratio was reversed, total plasma proteins being 7.1 g.%, albumin 3.25 g.%, globulin 3.85 g.%, ratio 0.85 : 1. The serum sodium was 309 mg. per 100 ml., potassium 20.4 mg. per 100 ml., and chlorides 641 mg. per 100 ml.

In spite of treatment by intravenous and rectal saline, the output of urine was scanty, and the blood urea continued to rise, reaching 264 mg. on July 22. He gradually deteriorated, the blood pressure continued to fall, and numerous crepitations were heard at the bases of the lungs. Addison's disease was suspected, but he did not respond to injections of deoxycortone acetate, and he died on July 30. For the last nine days of his illness his temperature was subnormal, never rising above 95.2° F. (35.1° C.).

Post-mortem Report

At the post-mortem examination both the pleural and the cut surfaces of the lungs showed numerous grey granules, more numerous in the upper parts of the lungs and resembling miliary tubercles. The heart weighed 11 oz. (310 g.), and, apart from two small petechial haemorrhages on the surface, appeared normal. The liver weighed 64 oz. (2 kg.) and was of a tawny brown colour. The gall-bladder was fibrosed. The right kidney weighed 3¾ oz. (106 g.) and the left 3 oz. (85 g.). Both appeared to be arteriosclerotic, with thin not clearly demarcated cortex. Both suprarenals were very small, only one-quarter the normal size. The spleen weighed 24 oz. (680 g.); the cut surface had a gelatinous look and showed numerous very small nodules; normal Malpighian bodies were not visible. The tracheo-bronchial and tracheal lymph nodes were much enlarged and soft, as were also the nodes around the head of the pancreas. The thyroid was small and the testes were atrophied. The brain showed no abnormality, but on searching for the pituitary it was a surprise to find the pituitary fossa completely empty. Careful examination was made for remnants of pituitary tissue or scar tissue, but none was seen.

On histological examination, sections of the lung, liver, spleen, and tracheo-bronchial and pancreatic lymph nodes all showed the characteristic picture of sarcoidosis—namely, discrete epithelioid-cell follicles containing giant cells. There was no tendency to caseation, but some follicles were in the stage of hyaline fibrosis.

The kidney showed glomerulitis, many glomeruli being enlarged and a few showing fibrosis and hyaline degeneration. The tubules contained granular debris, and an occasional tubule had a deposit of calcium. The condition appeared to be subacute, and there was not the degree of interstitial fibrosis that one would have expected in kidneys of such small size due to chronic nephritis. A very occasional sarcoid lesion was present, but this was obviously insufficient to cause disturbance of function by anatomical destruction of tissue.

In the liver numerous sarcoid follicles were present. The normal architecture of the liver was considerably disorganized, resulting in fibrosis and some nodular reparative hyperplasia of the liver cells. The lungs showed miliary sarcoidosis. The testes showed fibrosis of the walls of the tubules. A layer of spermatogenic cells were present, but there were no spermatocytes. There was a complete absence of interstitial cells. Occasional sarcoid follicles were present in the interstitial tissue. The suprarenals showed marked atrophy of the cortex. A few sarcoid lesions were seen in the myocardium. A section of the infundibular stalk and hypothalamic region was prepared, but no evidence of sarcoidosis was found.

Discussion

This case shows many of the features of hypopituitarism as described by Sheehan and Summers (1949) in their comprehensive review of the syndrome—namely, (1) atrophy of testes, (2) complete loss of sex function, (3) loss of axillary and pubic hair, (4) absence of normal skin pigment, (5) characteristic flabby facies with thinning of the eyebrows and pallor of the skin, and (6) physical weakness. The return of sexual potency which occurred on testosterone treatment is also consistent with a pituitary deficiency. The patient was also at one time diagnosed, and treated, as a case of pernicious anaemia—a not infrequent error.

The history is clearly, therefore, one of hypopituitarism lasting for 17 years. Although it was not possible to demonstrate the actual sarcoid lesion in the pituitary, the finding of an empty sella indicates previous destruction by some pathological process, and, taking into consideration the known long duration of sarcoidosis, it seems probable that this had early affected the pituitary. Among other possible causes the "giant-cell granuloma of the pituitary" described by Oelbaum and Wainwright (1950) and by Doniach and Wright (1951) should perhaps be considered. This seems an extremely unlikely cause, however, as in two of the cases reported by them there was a peculiar granulomatous infiltration of the suprarenals, which was absent in our case; and also an empty sella has not so far been recorded as a result of this condition. Syphilis is another cause of hypopituitarism. Oelbaum (1952a), in a review of hypopituitarism in males, due to syphilis, mentions that in 2 out of 14 subjects the lesion resulted in an "empty sella." There was no question of syphilis in the case here reported.

Sheehan and Summers (1949) mention that sarcoidosis has been reported as a cause of hypopituitarism, and they discuss the empty sella. They state that it is a peculiar type of scarring in which the sella appears quite empty, but histological examination of the floor shows that there is a dense layer of fibrous tissue enclosing a very thin lamina of anterior lobe parenchyma. Tissue was unfortunately not taken from the floor of the sella in this case, but a section from the pituitary stalk and hypothalamic region revealed no evidence of disease. This finding of a normal hypothalamic region is probably to be correlated with the absence of diabetes insipidus.

Of particular interest is the nature of the renal failure and glomerulitis, which was the terminal event. Longcope and Freiman (1952), in their study of sarcoidosis, mention that transient albuminuria and cylindruria are not infrequent accompaniments of active sarcoidosis. In their series of cases at the Massachusetts General Hospital were four cases showing a significant amount of impairment of renal function, but in none was it severe enough to lead to a fatal issue. Klinefelter and Salley (1946) reviewed four cases of renal failure in sarcoidosis, including one of their own, but this case was unsupported by necropsy evidence. Without doubt, renal failure is a very rare complication of sarcoidosis, and it is difficult to state what relationship the nephritis bore to the sarcoidosis. Possibly it was some sort of toxic or allergic reaction.

On the other hand, the renal failure may have been partly due to the suprarenal atrophy secondary to the hypopituitarism. Oelbaum (1952b) reviewed six cases of hypopituitarism due to post-partum necrosis, and remarked that there may be a marked dissociation in the degree of functional impairment of the thyroid, adrenal cortex, and gonads. It has been known for many years that renal failure and a high blood urea occur in suprarenal insufficiency. Lewis (1952) has suggested that the mechanism of this failure may be the low renal blood flow and filtration rate resulting from the reduced blood pressure, blood volume, and cardiac output. A remarkable feature of this case was the fall in blood pressure at the time of the last admission. In view of the glomerular changes, it is suggested that there was probably a combination of the two factors.

Summary

A case of hypopituitarism which appeared to be due to sarcoidosis is reported and a discussion of its relationship to renal failure given.

We wish to express our thanks to Dr. T. Robson for the clinical notes, and to Professor H. L. Sheehan for his advice on the sections.

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At a small reception held at the Royal College of Midwives on October 25, the President and Council of the College were officially presented with a colour film, "The British Midwife," by the chairman of the board of directors of Cow and Gate Ltd. The film outlines the training of the midwife and goes on to illustrate the work of a rural practising midwife and her management of a normal case in all its stages, including close-ups of the delivery. Even if the picture shown is that of the rosier side of a midwife's life—the country scene is gay with blossom and sunshine—and a short film cannot show everything, it leaves one in no doubt that the work of the British midwife calls for standards of professional competence and a sense of vocation of a high order. It should appeal to the best type of recruit to the profession.

SIX CASES OF INFANTILE SCURVY

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"To-day in its grosser manifestations (scurvy) may be said to have ceased to exist."—H. C. CAMERON (1941) in "Fifty Years of Progress in Paediatrics."

Scurvy is one of the classical diseases with a simple, straightforward aetiology, which is easily prevented and cured, and which should be easily diagnosed. The infantile form (Barlow's disease) differs from the adult form in its clinical features only because of differences in anatomy and physiology.

Scurvy has been recognized for centuries, and, though nowadays very rare in this country, persists at the two ends of life. The type occurring in elderly people who live alone and do their own cooking is often termed "bachelor scurvy." Series of this type are recorded by McMillan and Inglis (1944) and by Brown (1951).

It is remarkable that, with the varieties of organization and propaganda brought to bear on the mother, infantile scurvy exists at all. It is, however, difficult even approximately to determine its present incidence. The authors of most standard textbooks confine themselves to variations on the theme that it is "a very rare condition." Garrod *et al.* (1953) record that from 1933 to 1942 only 25 cases of infantile scurvy were admitted to the Hospital for Sick Children, Glasgow. Brailsford (1953) quotes one case seen in 1947. This apart, we can trace no recent specific reference. During the past five years only 10 cases have been seen at the Hospital for Sick Children, Great Ormond Street (figures quoted by permission of the Medical Committee).

Reports from America (Ellenbogen *et al.*, 1951 ; Silverman, 1953), Canada (Coward, 1950), Australia (Packer, 1947), France (Guerin, 1949), Italy (Camera, 1948), and India (Mukherjee, 1952) all confirm that the disease is now rarely seen.

When infantile scurvy occurs nowadays it is always in artificially fed babies whose feeds have been so treated by heat or commercial process as to destroy the vitamin C and who have had no supplementary feeding with fruit or vegetable juices. The practice of warming orange juice occurs quite commonly in this country. Rarely, but not recently, scurvy has been reported in breast-fed babies when the mother also has a very deficient diet.

Case 1

A girl aged 1 year was admitted to hospital with a complaint of painful paralysed legs. The illness had begun four days earlier with cough, sore mouth, pyrexia, and apparent pain with inability to move the legs. Signs of bronchopneumonia had developed the following day, but, although the chest had improved with sulphamerazine, the other symptoms had grown worse. On admission to hospital, undiagnosed, the child was very pale, but was well developed and nourished. Temperature was 101° F. (38.3° C.) and pulse 140. There were no skin rashes or petechiae. Four incisor teeth were through, and around them the gums were red and swollen. Both legs were oedematous up to the

groins and were extremely tender to touch and on movement. Blood count: Hb, 38%; R.B.C., 4,120,000; W.B.C., 10,400.

The baby had been fed entirely on National dried milk since birth. No additions had been made to the diet, as the baby "wouldn't take them." There were two older children, both healthy.

Scurvy was diagnosed, and treatment was begun with ascorbic acid. Appetite was so lacking that the child would take nothing by mouth, so 200 mg. of ascorbic acid was given intramuscularly, and subsequently 50 mg. t.d.s. orally. The gum-swelling disappeared within the first six days, while the limbs became painless, though some oedema remained for a fortnight. After a month the Hb was 75% and the R.B.C. 5,200,000. The child was easily weaned to a mixed diet.

Case 2

A twin girl aged 7 months was referred to the surgical out-patient department because of proptosis of the left eye. Four weeks previously she had fallen from her pram, but no injury was then noted. A week later the eye was noticed to be protruding, but this had improved until four days before admission, when the swelling had rapidly increased. For the same period the child had been off her food and disliked her legs being moved.

On examination the left eye was proptosed. There were bruising of the upper lid, a small conjunctival haemorrhage, and slight pain on movement of the legs, though this was regarded as a positive Kernig sign. There was no pallor, rash, gum-swelling, or abnormal signs in other systems. The child was admitted with a provisional diagnosis of retrobulbar haematoma and meningeal irritation. She was seen by an ophthalmologist, who suggested that the proptosis might be secondary to a neoplasm, with scurvy as an alternative diagnosis. The diagnosis was not made firmly until the twin was admitted a short time later.

Case 3

The twin, a male, was admitted with swelling and tenderness of the knees of ten days' duration. For five days the child had been off his food and the gums had become swollen and blue. These features were confirmed on examination, though otherwise the baby looked healthy. The male child had a haemoglobin of 80% and the female of 96%.

Scurvy was diagnosed in both twins and was confirmed radiologically. Their diet had consisted of boiled cow's milk since birth. The mother stated that they would take no other food or supplement, but in the ward both accepted a mixed diet suitable for their age. There were two healthy older children.

The girl had already improved on ordinary ward feeding, which included orange juice and vegetable extracts, but no added vitamins. Both were given 100 mg. of ascorbic acid, and the male improved rapidly to equal the condition of his twin. His recovery was interrupted, however, by a pneumonic episode, which responded to penicillin. After their discharge the district nurse reported that they remained healthy and were taking a mixed diet.

Case 4

A boy of 8 months was admitted as a case of multiple arthritis. He had had a dry cough since cutting his first tooth two months previously. The legs had become painful three weeks before admission and gradually swollen and more tender. A week later he had had small epistaxes and developed red spots on the back and legs. For one week the urine had been dark. The baby had been fed since birth on boiled cow's milk, with sugar and a patent barley preparation as the only additions. Two brothers, aged 4 and 6, were healthy, but a sister, aged 2, had had a similar complaint at the same age and, though making a spontaneous recovery, was said still to have a limp because of a stiff knee.

On examination the child was apparently well nourished and of good colour. There were purple swellings of the upper gum round the central incisors. The skin of the legs and back showed a few small petechiae. The legs were flexed; movement was resented, and there was tender swelling of both legs up to the groins. The chest showed signs of a moderate bronchitis. Blood count: Hb, 57%; R.B.C., 3,890,000; W.B.C., 7,800.

The child was treated with ascorbic acid 100 mg. t.d.s. orally. Progress was rapid and he was discharged after a fortnight. The gums were then normal; cough, petechiae, and swelling of the legs had gone, and there was free movement of the limbs, though still slight tenderness on deep pressure.

Case 5

A girl of 7½ months was brought to her doctor by the mother, who complained that the baby would take only the first and last feeds of the day. The mother, who was of poor intelligence, had noticed nothing else abnormal. Questioning revealed that the first and last feeds were given with the child lying in her pram, and that for the feeds which she refused she was always picked up. The child had been fed on diluted milk and was said to have refused orange juice. Little reliance could be placed on the history.

On examination the child appeared well nourished but was irritable and somewhat pale. Handling the limbs was resented, but no other definite physical signs were found. There were no petechiae.

Scurvy was diagnosed, and confirmed radiologically. For three days 200 mg. of ascorbic acid was given daily intramuscularly, and thereafter 100 mg. daily by mouth. Response was dramatic, and within 10 days the child had returned to normal.

Case 6

A girl of 11 months was admitted with the diagnosis of a respiratory infection. For a week she had seemed "off colour" and irritable, and was becoming gradually worse. The diet had been National dried milk since birth, but the mother insisted that she had given orange juice and cod-liver oil regularly. There were four healthy older children.

Examination showed an ill child, well developed but rather pale and flabby. The temperature was 99.6° F. (37.55° C), and the pulse 120; the baby was dyspnoeic and irritable. There was facial oedema, particularly of the lower lids. She resented handling and her legs appeared tender. The mouth was dry and sore, but there was no swelling of the gums. There were scattered crepitations throughout both lungs.

A provisional diagnosis of bronchopneumonia was made, and, because of the facial oedema, nephritis was also considered. A radiograph taken for the chest showed bony changes of scurvy in the shoulder-joints, and further films showed advanced radiological changes elsewhere. Clinical response to ascorbic acid was dramatic, but radiological improvement was of course less rapid, and, two years later, there are still residual *x*-ray changes, though the child appears extremely healthy.

Diagnosis

The diagnosis should not, in theory, present much difficulty, and yet in this series only one case was diagnosed on first examination. Of the five cases sent into hospital none was even suspected before admission. One was not diagnosed until the twin arrived in hospital, and Case 6 was revealed by a radiograph taken nominally for the chest. The reason for this difficulty seems to be that, although the symptoms of scurvy are well known, the diagnosis is not considered because, as personal inquiry has shown us, there is a widespread opinion that infantile scurvy no longer exists. This impression has probably been contributed to by the absence of any case reports in the British literature for many years.

The diagnosis should usually be made on the occurrence of irritability and limb tenderness in an infant between 6

and 12 months old with the typical feeding history. Additional evidence may be found in the presence of gum-swelling or haematuria, though the latter is more commonly found on microscopical examination than as an early and constant symptom. We submit, in agreement with Mukherjee (1952), that when the diagnosis is made or suspected on clinical grounds it may best be confirmed by radiographs, and that radiology is of far more assistance, as well as quicker, easier, and kinder, than any biochemical or clinical test so far devised. Radiological confirmation has also the advantage that a therapeutic test need not be delayed, as, although symptoms are relieved, ascorbic acid will not affect the *x*-ray appearances for many days.

The typical radiological changes leave no doubt about the diagnosis, though the extreme variation in the distribution and severity of the lesions may make it necessary to take films of all the joints. The changes have been summarized by numerous authors (Shanks and Kerley, 1950; Mukherjee, 1952), but one finding we have not seen recorded previously: in Case 6 there were a few small scattered islands of dense bone in the left ischium, which disappeared completely in one month. Examination was thorough, but there were no similar changes elsewhere. This was, radiologically, an advanced case with many severely displaced epiphyses, and, though the child is completely well, cystic changes in the epiphyses of the knees still remain two years later.

We disagree with Kato (1932), who states that subperiosteal haemorrhages are the only radiological pathognomonic sign of scurvy, and with Brailsford (1953), who states that they are the earliest radiographic lesions. In our experience subperiosteal haemorrhages do not become calcified and clearly visible until healing begins, though then this feature may be very marked. In only one of our cases, radiologically the most severe, could early periosteal lifting be seen when the patient was first examined.

Discussion

The features of these six cases correspond to the accepted picture of infantile scurvy. The age incidence of 7–12 months is within that expected (6–12 months), and the first five cases had typical feeding histories. All six had four features in common: limb tenderness, good general nourishment and development, radiological changes, and a speedy response to vitamin C. The limb tenderness was constant, but varied from acute pseudoparalysis to simple dislike of handling. Pallor is said by Sheldon (1946) to be a common sign, and was observed in three cases, but it is probably better regarded as a measure of anaemia than as a specific feature of scurvy. Blood counts in four cases showed variations from a moderately severe anaemia to a normal blood picture. Gum-swelling was an inconstant finding, seen in three cases only. The proptosis with which Case 2 began is a well-recognized if unusual mode of onset of scurvy, as also is the acuteness with which the illness of Case 4 commenced. An unusual feature was the occurrence of moderate-to-severe chest infections in four cases at some stage. The petechiae (except in Case 4) and the follicular hyperkeratosis of the adult disease were not seen.

All the babies were bottle-fed and five of the mothers admitted giving no supplementary orange juice. Whether the statement of the mother of Case 6, that the baby had received regular orange juice, was true, can only be a matter for conjecture. To claim this as a case of scurvy developing in spite of regular orange juice would need stronger evidence. In three cases the mother stated that the baby would not take mixed feeding: in two there was alleged to be an intolerance of orange juice, but in no instance was this confirmed.

For the prevention of scurvy it is well known and widely publicized that all artificially fed babies need extra vitamin C, and the orange juice supplement supplied through welfare clinics is clearly adequate. The difficulty lies in providing for the occasional apathetic or ignorant mother.

For practical purposes the disease does not occur in breast-fed babies. Indeed, the appearance of infantile scurvy, unknown before 1850, followed the adoption of artificial-feeding methods, at a time when adult scurvy was vanishing. Among many other advantages, natural feeding, still too often abandoned on inadequate grounds, remains the simplest and surest preventive measure. Alternative feeding methods in which supplements are essential to prevent deficiency diseases are well described as "artificial."

Ascorbic acid is the most effective method of treating the established case, and response serves as a valuable confirmation of the diagnosis.

Conclusion

These six cases were all seen in West Cornwall (population approximately 250,000) in the three years 1950–2, and at least one valid conclusion can be drawn—namely, that, although infantile scurvy should not exist nowadays, it quite definitely does. If this is not realized, cases that do occur are far less likely to be diagnosed at an early stage. We feel that the attitude implicit in the quotation which heads this article is not only untrue, even as a generalization, but it is also a highly dangerous one to adopt. The diagnosis of the occasional case of scurvy is far more important because of its curability than the exact diagnosis of many a less amenable disease. The elder sister of Case 4 probably illustrates this.

[Since the preparation of this paper a further typical case in an artificially fed infant aged 10 months has been described by Dr. Eric Townsend, of Camborne, at a meeting of the Cornwall Clinical Society.]

Summary

Six recent cases of infantile scurvy are recorded.

Limb tenderness was the most constant positive feature; all the patients were well nourished and had been artificially fed; all responded to ascorbic acid therapy.

The place of radiology in the diagnosis is emphasized.

The occurrence of these cases provides an important reminder that infantile scurvy—an easily diagnosed and treated disease—still exists, depite modern welfare facilities.

We should like to thank our colleagues in the West Cornwall Clinical area, both in consultant and in general practice, for their very willing co-operation. We are grateful also to the staff of the Library of the British Medical Association for much help with the literature.

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The Rockefeller Institute for Medical Research has announced the publication in January next of the *Journal of Biophysical and Biochemical Cytology*, which will publish papers on the morphological, biochemical, and biophysical aspects of the structure of cells and their components, and on the functions of these components. The journal will give special attention to investigations dealing with the cellular organization at colloidal and molecular levels. It will appear six times a year at an annual subscription of $7.50.

THE FALLACY OF THE FURRED TONGUE

BY

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The belief that the general health of a person is reflected in the state of his tongue dates from the days of Hippocrates. In the lay mind this Hippocratic tradition has survived, more or less unimpaired, for some 24 centuries. Most mothers to-day still inspect their children's tongues with care, presumably arrive at certain diagnostic conclusions, and presumably institute appropriate therapeutic measures under the guidance of the local chemist.

In the medical world the concept of the tongue as a trustworthy mirror of health and as an aid to diagnosis in disease has been losing ground steadily during recent decades. Even so, some doubt about the importance or otherwise of a dirty tongue continues to be felt even among experts. One textbook on diseases of the tongue states: "It has been said that the tongue talks in two languages, and that in one it never lies, and that its evidence as an indication of health is not to be gainsaid. From the earliest times a mysterious sympathy has been thought to exist between the appearances of the tongue and the state of the alimentary canal, as if the tongue were a mirror or divining-glass in which is revealed the state of the bowels. In modern times this association has often been laughed at and decried, but he would be a brave man who would state that the patient with a furred or coated white tongue would not benefit considerably from a blue pill or a black draught" (Fitzwilliams, 1927).

Another standard work on the tongue is more sceptical: "The superficial appearances of the tongue are no longer regarded as the mirror of diseases of the intestinal tract, but as indicating local disease of the mouth" (Spencer and Cade, 1931). The authors go on to say, however, that "free eating and drinking overnight produces a thickly furred tongue next morning as the result of slight gastro-enteritis causing a check to the normal secretion of saliva." Lastly, an anonymous expert recently came out strongly for the Hippocratic approach. He suggested that a fur which persisted for 14 years on the tongue of an otherwise healthy man might be due to taking a diet of slops, drinking or eating to excess, blocked nose, constipation, excessive use of aperients, reverse peristalsis, an irritable focus in the alimentary tract, or "a reflex disturbance from elsewhere." He advised a cholecystogram, followed, if negative, by a barium meal and follow-through (with particular reference to a lesion in the lower ileum), a test meal, and, finally, a gastroscopy to exclude gastritis. He added a warning that treatment might prove difficult, and that "it is not always easy to account for a furred tongue" (*British Medical Journal*, 1953).

Evidently, then, an uneasy feeling lingers on, not only in the minds of the lay public but also among medical men, that there may be, after all, some connexion between a furred tongue and a variety of diseases or states of ill-health.

The Present Investigation

This survey was prompted by the observation that many apparently healthy infants, seen during routine infant welfare examinations (and presumably not given to "free eating and drinking overnight"), had heavily furred tongues. According to textbooks the tongue of healthy infants is almost or completely free from fur because furring is limited to areas bearing filiform papillae. Since these are small and insignificant in the young child, no epithelial scales and micro-organisms adhere to them, and no furring would be expected to occur. The finding of furred tongues in healthy infants led to a routine inspection of the tongue in older children seen in out-patient clinics. There appeared to be no connexion whatever between the state of their tongues and a variety of conditions commonly thought to give rise to a dirty tongue.

To check the validity of this clinical impression the state of the tongue in 750 children was subjected to statistical analysis. The ages of these children ranged from 2 weeks to 14 years. At the time of observation they were not suffering from any general illness or any acute local condition of the mouth and throat.

As Unna (1881) had abandoned a similar statistical survey because of the great variation in the pattern of fur seen, a simple classification of "tongue clean," "completely furred," and "furred at back only" was adopted. These three categories were then grouped against certain local (oro-naso-pharyngeal) and general symptoms and signs which are said to lead to furring of the tongue (Table I).

TABLE I.—*Incidence of Clean or Furred Tongue in Relation to Certain Clinical Findings and Symptoms (for Explanation see Text)*

	Tongue Clean	Tongue Furred		Total
		Whole	Back	
Number of cases	282	281	187	750
A. Tonsils red, enlarged	53 (66)	75 (66)	48 (44)	176
B. Tonsils clean, enlarged	149 (131)	104 (130)	94 (86)	347
C. Nose blocked	50 (40)	38 (40)	19 (27)	107
D. Glands present	90 (88)	80 (88)	64 (58)	234
E. Appetite bad	41 (49)	56 (49)	33 (32)	130
F. Bowels costive	27 (30)	33 (30)	19 (19)	79
G. Diarrhoea	9 (7)	8 (7)	2 (5)	19
H. Teeth, two or more carious	56 (50)	44 (49)	32 (33)	132

The figures bracketed in the table indicate the number of clean or dirty tongues which would be expected in each

TABLE II.—*Incidence of Clean or Furred Tongue Related to Final Diagnosis and Certain Symptoms and Signs (for Explanation see Text)*

	No. of Cases	1A	1B	2	3	4	5	6	7	8	9	10	11
Total No.	750	133	168	129	104	40	32	14	21	60	28	8	13
Tongue furred:													
Whole	281	46 (50)	62 (63)	50 (49)	41 (39)	19 (15)	15 (12)	4 (5)	13 (8)	16 (22)	10 (10)	3 (3)	2 (5)
Back	187	41 (33)	37 (42)	25 (32)	27 (26)	3 (10)	9 (8)	3 (4)	4 (5)	23 (15)	7 (7)	2 (2)	6 (3)
Whole or back	468	87 (83)	99 (105)	75 (81)	68 (65)	22 (25)	24 (20)	7 (9)	17 (13)	39 (37)	17 (17)	5 (5)	8 (8)
Tonsils red	176	41 (31)	45 (40)	25 (30)	17 (24)	5 (9)	7 (8)	5 (3)	4 (5)	14 (14)	7 (7)	3 (2)	3 (3)
Tonsils clean	347	63 (61)	77 (78)	39 (60)	62 (48)	18 (18)	18 (15)	6 (6)	8 (10)	30 (28)	16 (13)	3 (4)	7 (6)
Nose blocked	107	34 (19)	34 (24)	7 (18)	15 (15)	6 (6)	3 (5)	1 (2)	1 (3)	3 (8)	2 (4)	0 (1)	1 (2)
Glands present	234	79 (42)	60 (53)	20 (40)	22 (32)	9 (12)	8 (10)	7 (4)	4 (7)	16 (19)	7 (9)	2 (2)	0 (4)
Appetite bad	130	31 (23)	36 (29)	21 (22)	16 (18)	7 (7)	4 (6)	2 (2)	2 (4)	6 (11)	4 (5)	0 (1)	1 (2)
Bowels costive	79	16 (14)	9 (18)	30 (14)	8 (11)	2 (4)	3 (3)	1 (2)	2 (2)	4 (6)	2 (3)	0 (1)	2 (1)
Diarrhoea	19	2 (3)	2 (4)	10 (3)	3 (3)	0 (1)	0 (1)	0 (0)	0 (1)	1 (2)	1 (1)	0 (0)	0 (0)
Teeth, two or more carious	132	25 (23)	36 (30)	17 (23)	13 (18)	6 (7)	11 (6)	3 (2)	2 (4)	12 (11)	5 (5)	0 (1)	2 (2)

section if there were no association between the state of the tongue and the particular symptom or sign in question. It will be seen that only in sections A, E, and F is the proportion of total cases with tongue furred (whole or back) greater than the "expected" proportion, which might indicate a positive association between the symptom or sign and a furred tongue.

Statistical analysis, using the formula for determining the standard error in a binomial probability distribution, shows that as regards E and F the difference in proportions is not significant, and may be due to chances of sampling. In the case of A it appears that the probability of the difference in proportions being due to chance is only 2%. It must be remembered, however, that this relationship is selected from eight possible relationships as the one with the lowest probability of being due to chance. Thus the difference in the proportions cannot be looked on as the value of a standard normal variate, but must be considered as the largest member of a set of eight standard variates. Under these circumstances the probability level is not 2% but about 14% to 15%. It follows that the difference may be due to chance, and the figures do not indicate any association between a furred tongue and the presence of large red tonsils.

It therefore seems that there is no connexion between the presence or absence of fur on the tongue and the state of the tonsils, the nasal airway, the presence of cervical glands, the presence of carious teeth, the appetite, or the state of the bowels.

The second part of this investigation attempts to link the state of the tongue with the various medical or surgical conditions which were the original reason for the children's attendance at the clinic. As stated above, the children were not acutely ill, and a considerable number of normal children, seen in infant welfare clinics, are included (under section 3).

The various diagnoses are grouped under 11 headings (Table II):

1A. History of upper respiratory tract infection.

1B. History of lower respiratory tract infection (follow-up of primary tuberculosis, pertussis, and pneumonia; stridor).

2. Digestive system (constipation, herniae, "tongue-tie," feeding errors, healthy infants, worms).

3. Emotional (tics, nightmares, sleeplessness, anxiety, behaviour problems, stutter, cyclical syndrome).

4. Skeletal (knock-knee, bow-legs, pigeon chest, postural defects, obesity, "growing pains").

5. Cardiovascular (follow-up of rheumatic hearts, exocardial murmurs, congenital hearts).

6. Blood disorders (follow-up of anaemia, erythroblastosis, haemophilia).

7. Skin (warts, naevi, urticaria, dirty umbilicus, alopecia, moles).

8. Nervous system (epilepsy, history of convulsions, nervous headaches, spastics, follow-up of birth injury).

9. Genito-urinary (enuresis, phimosis, hypospadias, hydroceles).

10. Trauma (cephalhaematoma, sterno-mastoid tumour, post-concussional state, bruises).

11. Congenital (mongols, cranial and other bone dystrophies, syndactyly, talipes).

Again the figures in brackets represent the number of children with a particular state of the tongue or a particular symptom which would be expected to be found if there were no more than a chance association between that state or symptom and the particular diagnosis for which the child was seen.

The possibility of a positive association between a furred tongue and a given diagnosis arises only in sections 1A, 3, 5, and 7. Using the formula for standard error in a binomial probability distribution, it appears that, contrary to general belief, there is merely a chance association between a furred tongue and a history of upper respiratory tract infection. Also, as common sense would suggest, any association between a furred tongue and emotional upsets, heart murmurs, and skin lesions is purely accidental.

Summary

A deep-rooted belief exists in both lay and medical minds that a dirty tongue, in a child not suffering from an acute illness, is of significance.

Statistical analysis of the state of the tongue in 750 children shows that there is no connexion between a furred tongue and the state of the tonsils, the teeth, the presence of a free nasal airway, the presence of cervical glands, a poor appetite, or the action of the bowels.

Similarly, no association can be demonstrated between the state of the tongue and a variety of abnormalities ranging from tongue-tie to tics and from murmurs to mongolism.

I am grateful to Miss E. L. Parsons and Mr. J. F. Davison for their help in analysing the statistics collected for this investigation.

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RESPONSE TO SCHICK TOXIN IN NATURALLY IMMUNIZED INDIAN CHILDREN

BY

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Sensitization to the stimulus of antigen is an important property of active immunity. The degree of this sensitization in active antidiphtheritic immunity may in some cases be so high that even such a small quantity of antigen as is contained in one Schick test dose of toxin may stimulate production of antitoxin (Bousfield, 1945). In India, natural antidiphtheritic immunity seems to be highly prevalent (Lahiri, 1953). How far this immunity was associated with antigenic sensitization has been worked out in a small-scale field trial. In this small group of Indian children, increase of circulating antitoxin and the Schick conversion rate, two weeks after their first Schick test, have been shown to be so high that it was thought worth while reporting these results.

Materials and Methods

The Schick test toxin was a sterile dilution of a mature crude diphtheria toxin. The parent toxin was prepared in veal-infusion-proteose-peptone broth, and then stored for over four years in the cold. The toxin contained approximately 40 Lf per ml. and 15 LD_{50} per Lf. Dilutions of this toxin were made in sterile buffered saline of *p*H 7.6. The Schick test dose, administered in 0.2-ml. volume, contained 1/50 LD_{50} and 1/750 Lf.

The Schick test was read in a slightly different way. The subjects were all dark-skinned; hence development of an indurated area, at least 10 mm. in diameter, was the only criterion available for positive reaction. There was desquamation of epidermis over the indurated area a few days after the test. The heated control was also used as usual, but allergic reactions were rare.

Antitoxin titrations were done in rabbits following Jensen's (1933) technique. The human sera were tested against Lf/100 dose of the test toxin. The levels of antitoxin titre, at which the sera were tested, were 1/100, 1/20, 1/5, 1/2, 1, and 2.

Field Trial

Forty-seven boys and girls aged between 5 and 12 years completed all the tests. They had never received any artificial diphtheritic antigens before They had been living in crowded houses in not quite hygienic surroundings. Just before their first Schick test a sample of blood was drawn. The second sample of blood was drawn and the second Schick test was done two weeks after the first Schick test. The results are shown in Table I.

TABLE I.—*Response of Naturally Immunized Indian Children to the Stimulus of Schick Toxin*

Preliminary Immunity			Rise 2 Weeks after the First Schick Test		
No. of Subjects at Indicated Level	Antitoxin Titre (I.U.)	Schick Test Results	No. of Subjects at Indicated Level	Antitoxin Titre (I.U.)	Schick Test Results
32	<0·01	Positive	14	<0·01	Positive
9	0·01*	Negative	17	0·01*	Negative
4	0·05*	,,	10	0·05*	,,
2	0·2*	,,	3	0·2*	,,
			2	1·0*	,,
			1	>2·0	,,

* These figures mean that the titre is higher than the expressed figure but lower than the next higher figure.

Thus, over 50% of the Schick positives of the first test were converted to negative reactors merely with the stimulus of the Schick toxin. The rise of antitoxin titre was also considerable. An analysis of this rise in individual cases indicated that the lowest and the highest preliminary titres showed much less average increase than that shown by those at the middle of the range. The trend of this relative increase is shown in Table II.

TABLE II.—*Increase of Antitoxin Titre Relative to the Titre Prevailing Before Administration of the Toxin*

Groups	No. of Subjects at Indicated Level	Titre Prior to Schick Test (I.U.)	Titre 2 Weeks after Schick Test (I.U.)	Approximate Average Rise (Times)
I	14 15 3	<0·01	<0·01 0·01 0·05	4
II	2 5 1 1	0·01	0·01 0·05 1·0 >2·0	36
III	2 1 1	0·05	0·05 0·2 1·0	6
IV	2	0·2	0·2	Nil

Discussion

When such a small quantity of antigen as 1/750 Lf of diphtheria toxin, administered intracutaneously, could produce so remarkable a response as indicated above, there is nothing very much more to gain by immunizing them with large doses, such as 25 Lf, of a very potent toxoid. Perhaps, in highly sensitized subjects like these, a potent toxoid and a weak toxoid, administered in large doses, would produce similar results. Field trials of diphtheria prophylactics in Indian children, with a view to determining their comparative potency, would therefore be very much influenced by the prevailing natural immunity associated with a high degree of sensitization.

How such an intense sensitization to diphtheritic antigen was produced in these children is difficult to guess. Of course, they lived in an environment conducive to frequent exposures to infection. However, the incidence of clinical diphtheria appears to be small, and the available carrier-rate figures do not suggest any formidable source of infection. Is this sensitization then due to certain tissue characteristics peculiar to the Indian race, or is it just an active immunity produced by frequent latent infections from unexplored sources?

Summary

The state of sensitization to the stimulus of diphtheritic antigen was determined in a group of 47 naturally immunized Indian children. The Schick test toxin was the source of the stimulus. The response to this was measured by the increase of circulating antitoxin and by the Schick conversion rate. There was a large increase of antitoxin, and over 50% of the Schick positives of the first test became Schick negatives in the second test, two weeks after administration of the Schick-test toxin. Those who had just the protective quantity of antitoxin in their circulation responded most.

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Medical Memoranda

A Case of Scurvy Simulating a Gastric Neoplasm

The few recent papers on scurvy deal with the malady in adults, particularly the elderly male patient. Such a survey of "bachelor" scurvy was carried out by McMillan and Inglis (1944). In this review of 53 cases they concluded that the three predisposing factors were dietary ignorance, apathy, and poverty, in that order of importance. The following case, of a similar nature, occurred in an apathetic old man and presented certain features of interest. It demonstrates a hitherto unrecorded aspect of scurvy, in that the clinical and radiological features of the case closely simulated those of a gastric neoplasm.

CASE REPORT

A man aged 72, who had previously been living alone, was admitted on June 3, 1952. For the past year he had complained of increasing anorexia, epigastric discomfort unrelated to meals, and non-radiating precordial pain. During this period he had become increasingly weak, and was easily fatigued, and had lost 2 stone (12.7 kg.) in weight. After a sudden attack of severe substernal pain he developed a cough and dyspnoea; similar episodes had occurred six and two weeks before admission. One month previously he had had a small haematemesis and had noted bright-red blood in his stools for two weeks thereafter. His diet during the past year had consisted chiefly of bread and milk together with various soups. For an indeterminable period his skin had bruised very easily. His past health had been good, except for occasional "black-outs," preceded by an aura of abdominal discomfort which began about two years before. His daughter says that the black-outs were actually fits involving loss of consciousness, spasmodic twitching of the limbs, and incontinence.

Examination revealed a thin depressed, lethargic man with a rather muddy complexion and numerous petechiae over the arms, legs, and trunk. An ecchymosis 6 in. (15 cm.) in diameter was seen over the left thigh, and there was a shallow sacral bedsore. No clinical evidence of anaemia was observed; the edentulous mouth was foul with sores, and the palate was ulcerated. The gums did not bleed; Hess's armlet test was negative. Cardiovascular system: apex beat 3½ in. (9 cm.) from midline; B.P. 140/80; pulse 68; no bruit heard; both dorsalis pedis arteries palpable. There was a moderate degree of clubbing of the fingers and toes. Chest expansion was less than ½ in. (1.3 cm.): an impaired percussion note was heard at the right base posteriorly, together with medium crepitations with patchy pectoriloquy. Apart from ulcerated thrombosed haemorrhoids, no other abdominal abnormalities were noted. The central nervous system appeared normal.

Investigation.—Blood picture: Hb, 90% (13.2 g.%); leucocytes, 8,000 per c.mm.; platelets, 140,000 per c.mm.; bleeding-time 2 minutes (Ivy); clotting-time, 5½ minutes (Lee and White); film appeared normal. The E.C.G. showed changes typical of an old anterior cardiac infarction. *X*-ray film of chest showed emphysematous and atheromatous changes. The blood urea was 48 mg. per 100 ml.; serum protein, 7 g. per 100 ml.; albumin, 3.9 g. per 100 ml. The urine contained occasional pus cells with a moderate growth of *Bact. coli*. No acid-fast bacilli were seen in the sputum. Sigmoidoscopy revealed no organic lesion in the distal 10 in. (25 cm.) of bowel.

Tentative diagnoses of anterior cardiac infarction, haemorrhagic diathesis (probably scurvy), and epilepsy were made. Accordingly he was given a high protein diet and was saturated with ascorbic acid, 1 g. daily for two weeks, followed by 150 mg. daily for a month. During the course of treatment the haemorrhages rapidly decreased, and no new ones appeared. By June 27 occult blood had disappeared from the faeces. The epilepsy was satisfactorily controlled with ¼ gr. (32 mg.) of phenobarbitone three times a day. But in view of the presenting symptoms of anorexia, epigastric discomfort, loss of weight, and haematemesis, it was decided to examine the gastro-intestinal tract further, in order to exclude the possibility of a neoplasm.

On June 6 a barium-meal examination demonstrated an ulcer crater in the pre-pyloric area. The site of the ulcer led the radiologist to suggest a gastric neoplasm as the likely diagnosis. A surgical specialist confirmed the radiologist's opinion; and the patient was placed on the waiting-list for a laparotomy.

Following ascorbic acid treatment the patient continued to improve. He cast off the air of lassitude, gained weight, and began to relish his meals. On July 26 his blood chemistry was as follows: blood urea, 28 mg. per 100 ml.; serum protein, 6.3 g. per 100 ml.; albumin, 3.9 g. per 100 ml.; thymol turbidity, negative; colloid gold, negative.

Such satisfactory progress seemed to warrant a further radiological examination, and on July 11 an *x*-ray film revealed a normal pylorus, which was confirmed by gastroscopy the following day. Another barium-meal examination on August 12 was also normal. On September 12 gastric biopsy of a specimen taken as near as possible to the original site of the tumour revealed a natural glandular pattern, with haemorrhage into the superficial layer of the gastric mucosa.

The patient was discharged on August 29, and when subsequently seen at follow-up clinics his condition had remained satisfactory. The intrinsic pre-pyloric tumour first demonstrated was therefore thought to be a submucosal haematoma which had resolved following a course of ascorbic acid.

Comment

Examples of the protean haemorrhagic manifestations of scurvy are numerous. In the central nervous system the disease has simulated infantile paralysis (Lellis, 1927). Cases have been recorded with haemorrhage into the cord (Prakken, 1925), and into the brain and retina (Shapiro and Hurwitz, 1938); and the less bizarre complication of scorbutic neuritis was reviewed by Stewart (1925). Death from suprarenal haemorrhage whilst under treatment was reported by Worms *et al.* (1937); and pericardial haemorrhage complicating scurvy was discussed by Barton and Freeman (1934). There was no anaemia in this case, but, as pointed out by Crandon *et al.* (1940), anaemia and scurvy need not coexist.

Gastro-intestinal complications of scurvy are not common; a dyspeptic type of diarrhoea with a sanguineous discharge may on occasions be present (Price, 1933), and Whitby and Britton (1950) mention haematemesis as one of the more rare complications. Foote (1926) reported a case of scurvy simulating acute intussusception, but I can find no record of a gastric submucosal haematoma. Nowadays, when gastrectomy is one of the commoner operations, and intensive radiological investigations are part of a hospital routine, this case may be of interest; though it illustrates a rare complication of scurvy, it is one which could be too easily mistaken for a gastric carcinoma.

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Scurvy in Old Age

There are so many sources of vitamin C in a natural diet that the gross deficiency which produces scurvy occurs only in exceptional circumstances. Such circumstances are illustrated in the following case.

Case Report

A man aged 80 was admitted to Stapleton Hospital on June 4, 1953. He and his wife, a childless couple both old-age pensioners, lived together until December, 1952, when the wife was taken to hospital under a statutory order. She was found to be a senile dement and died a month after admission.

The patient continued to live alone, and for a time meals were supplied to him by the local authority mobile meals service. Being deaf and forgetful, he failed to answer the door so often when the van called that the service was discontinued. In June, 1953, a neighbour informed the police that he had not been seen for some days. He was therefore taken to a hostel and subsequently transferred to hospital.

The house in which he lived was stated to be in a filthy condition. There was no evidence of recent cooking, and money was found scattered about the rooms. Further investigations revealed that he had assets of over £1,500.

On examination he was found to be very deaf, mentally confused, and incapable of giving any account of himself. There was no evidence of wasting, but his skin and conjunctivae were icteric and he had large extravasations extending practically from the buttocks to the heels on both sides. The left leg was also oedematous. There were smaller areas of bruising on the posterior surfaces of the arms, and pin-point haemorrhages on the chest, which were not definitely related to the hair follicles. Splinter haemorrhages were seen under the nails and ecchymoses on the soft palate and conjunctivae. The patient was edentulous but the gums were healthy. No abnormalities of the hair follicles were seen. Blood pressure was 130/80 mm. Hg. There was evidence of a moderate degree of generalized arteriosclerosis in conformity with his age. No gross clinical abnormalities were revealed by further examination.

The blood count on admission showed 2,250,000 red cells per c.mm., of which 5% were reticulocytes; haemoglobin, 6.5 g. per 100 ml.; white cells, 3,590 per c.mm. (49% polymorphs, 47% lymphocytes, 4% monocytes). Mean corpuscular volume, 97 cubic μ; plasma bilirubin, 2.6 mg. per 100 ml. The reticulocytes had dropped to 2% by the sixth day after admission.

A preliminary examination of the urine showed him to be excreting 7.3 mg. of ascorbic acid per 100 ml. After ingesting 700 mg. of ascorbic acid daily for 12 days the concentration rose slowly and only reached 19.5 mg. per 100 ml. on the twelfth day. His petechial haemorrhages had disappeared by the third day after the saturation regime was begun and the large areas of bruising on the legs had faded at the end of a week.

Six days after admission his blood count showed 3,890.000 red cells per c.mm.; haemoglobin, 9.5 g. per 100 ml.; white cells 3,100 per c.mm. (46% polymorphs, 50% lymphocytes, 1% basophils, 1% eosinophils); M.C.V., 68 cubic μ; the film showed hypochromia. The patient had received no iron or other therapy apart from his ascorbic acid.

At this stage he was put on iron and ammonium citrate mixture, 1 g. three times daily, and given totals of 350 mg. of thiamine, 350 mg. of nicotinic acid, and 10 ml. of crude liver extract by injection in the course of 10 days. The red cells increased to 4,600,000 and the haemoglobin to 14.5 g.% on July 3.

His physical condition improved rapidly, and within a fortnight he was up and about and doing odd jobs in the ward. His mental condition unfortunately showed no parallel improvement. He was discharged to the care of a niece, as he was no longer able to look after himself.

COMMENTS

Although mild degrees of nutritional deficiency are frequent enough in old people who live alone, gross deficiency syndromes amounting to clinical scurvy or pellagra are exceedingly rare. Senile purpura is often mistaken for the former, and glossitis originating from dentures or the use of antibiotics combined with peripheral vascular disease can produce a clinical picture which is sometimes mistaken for pellagra in aged persons.

During the past three years we have seen only one other case of scurvy among the aged sick, this patient being a feeble-minded man who lived alone. During the course of two years in Belmont Road Hospital, Liverpool—a hospital which catered for the aged sick of that city—one of us saw four cases of scurvy.

The history in all these cases is much the same. The old person lives alone and never gets a "cooked meal." Among this population, making tea to go with bread-and-butter or frying meat, egg, or fish is not reckoned as cooking a meal. A "cooked meal" includes potatoes and a vegetable.

Sheldon (1948), in his survey of Wolverhampton old people, showed that widows tended to preserve the home and the home routine when the partner died, whereas widowers did not. Elderly women when living alone will cook a meal in the sense described above, whereas elderly men will not. It is not surprising, therefore, that all the scorbutics we have met with in this age group were old men.

There are two institutions in our cities which cater for the needs of lonely old people and help to keep the incidence of scurvy low. For those who can walk there is the local fish-and-chip shop. For those confined to the house there is the mobile meals service. The cooked meal delivered by the local authority three times a week supplies many potential deficiencies, and the potatoes which it always contains are an excellent source of vitamin C. It is frequently reported that these people, rather than cook a meal for themselves, will consume half the meal on the day it is delivered and save half for heating up on the next day. The nutritionist might object to the wastage of vitamin C by this procedure, but in practice it seems that the meal retains sufficient vitamins to supply the needs of the old people.

The case recorded illustrates destitution in the midst of plenty which is occasionally a tragic feature of old age. There was enough money to purchase food, but neither partner was mentally capable of looking after the home. Although some improvement occurred in the patient's mental condition after iron and vitamin C and B complex supplements, there was no cure such as is seen in cases of pellagra. The mental deterioration in both partners obviously antedated the scurvy—it was a cause rather than a consequence of the deficiency.

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Kwashiorkor Syndrome in a 3-months-old African Infant

Kwashiorkor is believed to be exceedingly rare under the age of 6 months (Trowell and Davies, 1952), and in a study of 1,000 cases recorded in the literature no case was reported under the age of 3 months. Cases in the 4–6 months group were those in which breast-feeding had failed and the infant was fed on starchy foods from birth.

The following case is of interest in that the infant was breast-fed from birth and presented at the age of 3 months with all the signs of advanced kwashiorkor.

CASE REPORT

A female Jaluo baby aged 3 months was admitted to hospital on March 5, 1953, weighing 6 lb. (2.7 kg.). The mother gave a history that the child had been born at home one month prematurely (birth weight not known), and although small was apparently healthy. Breast-feeding was established without difficulty and the child thrived. At the age of 1 month she developed oedema of the face and feet and started to have loose stools—an average of four bulky stools being passed in twenty-four hours. The baby continued to feed well, with very occasional vomiting after feeds. There was no history of an infection or other illness during the first three months of life.

On examination she appeared contented and quite mentally alert. There was marked oedema of the face, hands, and feet, but no apparent loss of subcutaneous fat. The skin was pale and depigmented and the hair quite white. Examination of the abdomen showed the liver to be enlarged to three fingerbreadths below the costal margin. No abnormalities were detected clinically in any of the other systems.

Laboratory Investigations.—Blood slide, negative for malaria parasites. Mantoux 1:1,000, negative. Hb, 85%; red blood cells, 3,210,000 per c.mm.; white blood cells, 4,900 per c.mm. (polymorphs 42%, lymphocytes 57%, monocytes 1%). A blood film showed no abnormalities. Urine contained no albumin. Blood urea, 25 mg. per 100 ml. Plasma proteins: total serum protein, 4.02%; albumin 1.73%; α globulin 0.27%; β globulin 1.39%; γ globulin 0.63%. Ide test, negative. Mother's Kahn test, negative. Mother's breast milk: protein, 1.42%; lactose, 7.1%; fat, 2.4%.

Breast-feeding was maintained while the infant was in hospital, as the mother had an adequate supply, an average gain of 3 oz. (85 g.) being recorded after test weighing. An additional supplement of 8 g. of protein in the twenty-four hours was given in the form of dried skimmed milk, which the child took readily.

No clinical improvement occurred, and on March 19 it was noticed that the child had become more oedematous and was disinclined to feed. Tube feeding was instituted for twenty-four hours, with expressed breast milk and dried skimmed milk, after which she seemed better and oral feeding was recommenced. On March 24 the condition deteriorated suddenly. The child became dyspnoeic and was found to have a left-lower-lobe pneumonia. Penicillin was given immediately, but the child died two days later.

At post-mortem examination the clinical finding of a left-lower-lobe pneumonia was confirmed. Examination of the abdomen revealed an enlarged pale liver. Kidneys, spleen, and pancreas were all macroscopically normal. No abnormality was discovered in any other system. The pathological report on sections of liver and pancreas was: "The liver shows generalized fatty change. There is no evidence of cirrhosis. There is some atrophy and fibrosis of the pancreas."

My thanks are due to the Honourable Director of Medical Services, Kenya Colony, for permission to publish and to Mr. Pearson, of the Medical Research Laboratory, Nairobi, for the biochemical investigations.

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Reviews

BRITISH OBSTETRICS AND GYNAECOLOGY

Twenty-five Years: The Story of the Royal College of Obstetricians and Gynaecologists, 1929–1954. By Sir William Fletcher Shaw, M.D., F.R.C.P., F.R.C.O.G., Hon.LL.D. (Pp. 192+viii; illustrated. 21s.) London: J. and A. Churchill, Ltd. 1954.

Historical Review of British Obstetrics and Gynaecology, 1800–1950. Edited by J. M. Munro Kerr, R. W. Johnstone, and Miles H. Phillips. (Pp. 419. 30s.) London and Edinburgh: E. and S. Livingstone, Ltd. 1954.

The publication of these two volumes was timed to mark the Silver Jubilee of the Royal College of Obstetricians and Gynaecologists, and the latter is a birthday gift to the College on this occasion by a group of senior Fellows.

At the beginning of last century the President of the Royal College of Physicians told Sir Robert Peel, the then Prime Minister, that "no man who has an academic education ought to practise obstetrics," and a little later stated that "obstetrics is no calling for a gentleman." This attitude, shared by both the Royal Colleges, persisted, with a difference in degree rather than in kind, up to the end of the first world war.

Sir William Fletcher Shaw conceived the idea of a college: (*a*) to provide a portal through which all would-be gynaecological consultants must pass; (*b*) to prevent the divorce of obstetrics from gynaecology; (*c*) to bind the teachers of obstetrics and gynaecology together; and (*d*) to speak as the representative body of all obstetricians and gynaecologists. King Henry VIII founded the Royal College of Physicians in 1518 on the advice of Linacre. The College of Obstetricians and Gynaecologists was born on September 9, 1929, as a limited liability company registered under the Board of Trade. It had but nine members, was divided by dissension and devoid of funds. By 1932 it had a home of its own in London which was opened by H.R.H. the Duchess of York, 228 members, a coat of arms, gowns, and procedure, together with funds exceeding £15,000. In March, 1947, the Royal Charter was granted, and later in the same year Queen Elizabeth, now the Queen Mother, graciously consented to become its patron.

The remarkable story of how an imperial college was born and from the outset demanded clinical training before its diploma was granted, of the clash of dynamic personalities, of the generosity of Lord Riddell, and of much else is recorded in *Twenty-five Years*. Much credit must be given to Dr. Harvey Flack for the expert planning of the book, but its vivid style is imparted by the author, for nine years honorary secretary and five years President of the College. It will be read with amazement for many years to come.

The *Historical Review of British Obstetrics and Gynaecology, 1800–1950*, is a more ambitious work. The general review is divided into three periods: 1800–1850, 1851–1900, and 1901–1950. There follow chapters devoted to special subjects, and the book concludes with a mere 35 pages concerning gynaecology. The planning of the book introduces grave difficulties of perspective. Decapitation and symphysiotomy, for example, are discussed in all three parts, whereas trial labour is dismissed in two or three lines and the rhesus factor in two paragraphs. The matter discussed is, however, of absorbing interest and may be illustrated by the question of the expression of the placenta. The Rotunda Hospital sought to claim priority for Credé's method until a Dublin historian showed that it had probably been practised by Smellie and had certainly been described by his disciple John Harvie. The history of the development of the obstetric forceps is admirably delineated and the chapters are full of information which is not easily available elsewhere. The chapters on special subjects cover a wide field, and particular mention may be made of those dealing with antenatal care, puerperal infection, obstetric anaesthesia and analgesia, and the development of the medical schools.

It is doubtful whether such a book can properly be written by nineteen authors, and much of it lacks the authentic breath of history. Nevertheless it contains much history and much information, and no gynaecologist can afford to omit from his library this generous and valuable birthday gift to the Royal College of Obstetricians and Gynaecologists.

G. W. THEOBALD.

ELEMENTS OF SURGERY

The Foundations of Surgery. By George Perkins, M.C., M.Ch., F.R.C.S. (Pp. 236+viii. 10s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

This is a handy little book on the elements of surgery intended for students who are just beginning their clinical work. The preface states that "the title is intentionally grandiose in order that a first-year student need not be ashamed to be seen reading it in a train. It should, of course, be called 'Surgery for Toddlers.'" The author is too modest, for he has written an unusually readable account of some of the fundamental facts of surgery. His sentences are short and crisp. The first sentence in the book states, "Your aim in life is to cure the sick," while the last runs, "Toes that are not straight are worse than useless." His wit is pointed; after enumerating the available defences against infection he ends with, "Now go to Casualty and see how badly these principles are carried out!" Sometimes the arrow is pointed against his own hospital; as when he states that it was at one time necessary after an amputation to hang a tourniquet on the end of the patients' bed for immediate use in case of secondary haemorrhage, and adds, "St. Thomas's being one of the older and more conservative hospitals still maintains the custom, although the rubber of the tourniquet has long ago perished and the nurses do not know how to apply it." The author is lighthearted: "Guessing the nature of a lump is a great sport"; "An aneurysm situated on the arch of the aorta gives rise to signs which are the delight of the physician."

Pithy, dogmatic teaching is very delightful and impressive, but it has its drawbacks. One cannot in fairness lump together in one description the four main chronic inflammations, for tubercle, syphilis, leprosy, and actinomycosis have as many differences as resemblances. Moreover, though it is brave to attempt the impossible task of giving even an elementary account of the chief acute abdominal emergencies in 13 short pages, the brevity is at the expense of accuracy. There are several unjustifiable generalizations in this section.

The author excluded illustrations so as to make the book cheaper. We did not miss them, since his style is picturesque. There is much wisdom in this book, and we hope there will be a few changes in the second edition, which is almost certain to be required.

ZACHARY COPE.

VIROLOGY

Textbook of Virology for Students and Practitioners of Medicine. By A. J. Rhodes, M.D., F.R.C.P.(Edin.), and C. E. van Rooyen, M.D., D.Sc.(Edin.), M.R.C.P.(Lond.). Second edition. (Pp. 562+xvi; 76 illustrations. 61s. 6d.) London: Baillière, Tindall and Cox. 1953.

The larger book on *The Virus Diseases of Man*, by van Rooyen and Rhodes, has long been an essential part of the equipment of the virus worker. The same authors intend this shorter work on the same theme, now in its second edition, for undergraduate and postgraduate students. They have throughout stressed principles and dealt lightly with technical details. The first quarter of the book is occupied by a description of the general nature of viruses, the forms of disease they produce, and the techniques for handling them in the laboratory. The rest of the book contains an account, often succinct but always lucid, of each individual virus and rickettsial infection together with its epidemiology, laboratory diagnosis, and therapy. Although it is an easy and pleasant book to use, it may be found longer than necessary by undergraduate students in this country, who

have a smaller proportion of their curriculum allotted to bacteriology and virology than most of their Canadian and American confrères. Postgraduate students and practitioners who wish to be familiar with both the scope and the limitations of virology will find it a convenient source of reading and of reference. To aid the latter there is an excellent index running to over 30 pages and helpful lists for further reading. The standard of production is high.

KEITH DUMBELL.

INFANT FEEDING

Notes on Infant Feeding. By Stanley Graham, M.D., F.R.C.P.Ed., F.R.F.P.S.(Glas.), and Robert A. Shanks, M.D., M.R.C.P.(Lond.), F.R.F.P.S.(Glas.). Fourth edition. (Pp. 74. 4s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

The authors are to be warmly congratulated upon this excellent little notebook, now in its fourth edition. Here will be found the essentials of infant feeding described clearly and concisely and with sufficient explanation of basic principles to stimulate the reader's interest. Breast-feeding, artificial feeding, and the feeding of premature infants are covered in detail, and the instruction given is entirely acceptable. Then follow sections dealing with failure to thrive and with diarrhoea and vomiting—difficult to describe in condensed form, but skilfully accomplished within the compass set by the authors themselves. Two appendices give useful facts about developmental progress and weights and measures.

There are few even among the recognized leaders who are able to give a résumé of their knowledge and experience in compact as well as detailed and accurate form. Professor Graham and Dr. Shanks have achieved this, and their little book may be strongly recommended, not only to medical students, but to general practitioners and other doctors concerned with the feeding of young children.

NORMAN B. CAPON.

EPIDURAL BLOCK

Spinal Epidural Analgesia. By P. R. Bromage, M.B., B.S. (Lond.), F.F.A.R.C.S., D.A. (Pp. 123+vii; 41 figures. 15s.) Edinburgh and London: E. and S. Livingstone Ltd. 1954.

Epidural analgesia has not achieved great popularity in this country. The time involved in its performance, the uncertainty of result, the technical difficulties of the method, and the availability of a high standard of general anaesthesia, particularly since the advent of the relaxants, have all conspired against this type of analgesia. There are many occasions, however, as the book points out, when the method is invaluable, and every anaesthetist and surgeon should know how to perform one of these blocks. The opportunities to develop personal skill at it may be rare. This book will to a great extent take their place. Good technique alone is not enough. Knowledge of the effects of epidural analgesia and judgment as to when to use it are equally important.

The author summarizes his experiences as an anaesthetist who has taken a special interest in epidural analgesia. The anatomy and physiology of the epidural space are described, then drugs, equipment, and the technique of the block are dealt with in some detail. Outside of general surgery, several interesting therapeutic uses for the block in painful vascular and inflammatory diseases are given. Finally come the indications and contraindications. Here the author's wide experience makes him temperate in his advocacy of the method. Little of value in connexion with this subject has been omitted, and the book will be of the highest value to anyone who wishes to perform epidural analgesia. The style is clear, the illustrations are helpful, and the references extensive. An index both of authors and of subjects is included. Altogether this is a first-class monograph and a worth-while acquisition for any anaesthetist or surgeon.

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DISEASES OF THE RETINA

Diseases of the Retina. By Herman Elwyn, M.D. Second edition. (Pp. 713; 243 illustrations, 20 in colour. 85s.) London: J. and A. Churchill Ltd. 1954.

The second edition of *Diseases of the Retina*, by Herman Elwyn, comes seven years after the original publication and is some 125 pages larger. The account of the vascular disorders of the retina, which constituted the first two sections of the original edition and was its outstanding feature, remains outstanding in the present edition. These sections have been enlarged in a critical revision and by the addition of a new chapter dealing with retrolental fibroplasia in a detailed and adequate manner. Much new material has been added to the account of the diabetic disorders of the retina, and there is also some new material on the hereditary disorders. For the rest, the text is largely a reprint of the first edition. As in the previous edition the illustrations and bibliographies have been well chosen.

ARNOLD SORSBY.

ANTIMALARIA CAMPAIGN IN SARDINIA

The Sardinian Project: An Experiment in the Eradication of an Indigenous Malarious Vector. By John A. Logan, with the collaboration of T. H. G. Aitken, G. U. Casini, F. W. Knipe, J. Maier, and A. J. Patterson. (Pp. 415+xxix; illustrated. No price.) Baltimore: The Johns Hopkins Press. London: Geoffrey Cumberlege. 1953.

This is an account of an attempt to eradicate *Anopheles labranchiae* from Sardinia. The project was undertaken in order to investigate the feasibility of eradication technique as a means of malaria control in that region, for, though an imported anopheline had been eradicated in Brazil and Upper Egypt, elimination of an indigenous species had not previously been attempted. It was intended also to abolish malaria, which was a serious obstacle to the island's development.

Anopheles labranchiae was believed to be a purely domestic mosquito, but in Sardinia its occasional occurrence independent of man indicated that it could not be eradicated by residual insecticidal spraying of buildings. During the early part of the campaign this anti-adult procedure was used extensively, but its use as an eradication measure decreased steadily until it was practically abandoned. Control of the aquatic stages was complicated by the fact that it could breed in almost any collection of fresh water, with the result that more than a million breeding-places required regular treatment. Moreover, larviciding was ineffective unless the habitat was prepared beforehand by removing vegetation. Nevertheless, although two-thirds of all water collections in 1946 contained larvae, two years later hundreds of scouts had to search for weeks to find a single breeding-place.

As a result of the campaign malaria was successfully eliminated, new agricultural land was reclaimed by the control measures, and the island's potentialities for long-range development are now being surveyed with a view to development and colonization from Italy. The vector eradication project, however, was a failure in spite of every effort.

This interesting book is a very readable account of the campaign, and includes amongst the appendices a valuable discussion of biological factors in species eradication.

T. H. DAVEY.

The Medical Annual 1954 (John Wright & Sons Ltd., 32s. 6d.) continues to present its well-documented, practical survey of advances in medicine and surgery, under the editorship of Sir Henry Tidy and Professor R. Milnes Walker, the latter succeeding the late Professor A. Rendle Short, who for thirty-five years had been actively associated with the editing of this indispensable annual volume. All the familiar features are there within the familiar green boards that cover the book, and we may note the editors' emphasis in the introduction to advances in knowledge of the functions and disorders of the liver, a separate section now being devoted to this.

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URINARY INFECTIONS

The presentation to the clinician of many chemotherapeutic substances having an action against the organisms which infect the urinary tract has placed upon him a heavy responsibility for their proper use. It has also multiplied the work of the bacteriologist, who is now expected to find out not only what organisms are present but also to say to what drugs they are sensitive. Three articles on the subject[1 2 3] in the *Journal* of October 30 are timely because they indicate the limitations of such drugs and the factors which militate against successful therapy; they also make it clear that there can be no complacency in treating these infections and that many of the fundamental principles known before the advent of antibiotics must still be applied if cures are to be obtained.

Garrod, Shooter, and Curwen[1] investigated the results of treatment in 686 patients, grouping them according to the patient's condition, the infecting organism, and the drug used. They confirm the widely held opinion that the patient's condition is the most important factor, dividing their cases into those with a urinary tract abnormality, those with a history of previous infection, and those with neither. When an abnormality of the urinary tract is present the prognosis for cure of the infection is poor, and even if at first a sterile urine is obtained recurrence of infection is the rule unless the abnormality is corrected surgically. The prognosis is good when the urinary tract is normal and there has been no previous infection; in this group 80% of males and 88% of females were cured. The history of a previous urinary infection makes the outlook less favourable. The nature of the infecting organism also has an influence on the prognosis: coccal infections are most easily eliminated, and then coliform infections, provided drugs to which they are sensitive are used. Some patients, however, particularly those with coccal infections, were cured even though a drug considered inappropriate by *in vitro* tests was used. Proteus, pyocyanea, and paracolon infections proved the most resistant to therapy. The choice of the actual drug used out of those to which the organisms were sensitive appeared to have little effect on the outcome, and sulphonamides must keep their place in treatment if only because they are less costly than the newer antibiotics.

Durham, Shooter, and Curwen[2] carried out tests to discover the value of sulphonamides in preventing infection after vaginal operations. Sixty patients were given 1 gramme of "sulphatriad" three times a day for seven days after operation, and 42 similar cases were used as controls and given no sulphonamide. In both groups a large majority of the patients became infected, and although coliform infections were to some extent lessened by sulphonamide those due to *Str. faecalis* were increased. Table V in the paper by Garrod and his colleagues showed that *Str. faecalis* was 100% resistant to sulphonamides, but only 17% of the organisms tested were resistant to penicillin. This is surely an indication for combined therapy in these cases. The main factor in producing the high rate of infection in the gynaecological cases was the use of the catheter, whether indwelling or used intermittently. Out of six patients not catheterized five were free from infection, while of 11 repeatedly catheterized only one remained free. Catheterization of a female patient is usually carried out by a nurse, and the technique sometimes leaves much to be desired. A widely read textbook of nursing makes no mention of the need for a lubricant for the catheter, and a recent inquiry by the British Association of Urological Surgeons showed that in most hospitals throughout the country the use of a lubricant for the female catheter is not considered necessary. The female urethral mucous membrane is as delicate as that of the male and just as sensitive to the effects of trauma. It is perhaps for this reason that the rigid glass or metal catheter has been largely superseded by the soft rubber instrument, but it must be apparent that the introduction, without contamination, of a soft catheter into the urethra of a stout woman lying in bed is difficult, especially if it is attempted single-handed. The use of a catheter after pelvic operations is unfortunately often necessary, although it can sometimes be avoided by giving a parasympathetic stimulant such as carbachol. If a catheter has to be passed in the ward its insertion should be invested with the full rites of a surgical operation, just as it is in paraplegic cases.[4]

The paper by Shackman and Messent[5] discussed the effect of an indwelling catheter on the bacteriology of the male urethra and bladder. After prostatectomy by any method in which the bladder is completely closed an indwelling catheter is unavoidable,

[1] *British Medical Journal*, 1954, **2**, 1003.
[2] Ibid., 1954, **2**, 1008.
[3] Ibid., 1954, **2**, 1009.
[4] Hardy, A. G., *J. Bone Jt Surg.*, 1954, **36B**, 368.
[5] *British Medical Journal*, 1953, **2**, 954.
[6] Page B. H., *British Medical Journal*, 1952, **2**, 1415.
[7] Riches, E. W., *Practitioner*, 1952, **169**, 392.

and when it is retained for any length of time urethritis results, less severe when the catheter is made of latex rubber. Some degree of cystitis follows in the majority of cases. The organisms present in the male urethra before catheterization are saprophytic, with staphylococci predominating; after prostatectomy there is a development of *Bacterium coli*. This is also the commonest organism in the bladder both before and after the prostatectomy, but proteus strains increase after operation. There is no invariable relationship between the urethral and bladder organisms either before or after prostatectomy and catheterization.

There are some important lessons to be learned from these reports. The exclusion of a urinary tract abnormality is essential if chemotherapy is to succeed. This may in some cases be done by an intravenous pyelogram, but other cases require more elaborate investigations. Even routine intravenous pyelograms for all cases of urinary infection will throw an added burden on already overtaxed *x*-ray departments, and in the absence of clinical evidence of abnormality it is a practical concession to allow one full course of treatment by the drug found appropriate after sensitivity tests. This course must be given in full dosage to avoid the development of resistant strains of bacteria. Combined therapy with more than one agent—the advantages and limitations of which have been discussed by Garrod[5]—may often prove of greater value than treatment by a single drug both in prophylaxis after operation and in treatment. The use of penicillin and sulphonamide together appears to be of particular value after prostatectomy.

Catheterization must be atraumatic as well as aseptic. "The cleaner you are the better, the gentler you are the best" is a good urological motto and applies to both sexes. The female catheter as well as the male should be lubricated by a sterile lubricant, and the importance of a careful technique should be impressed upon all who have to pass catheters. Red rubber catheters appear to have a greater irritant effect on the urethra than latex[6] or possibly plastic instruments; they should not be used when an indwelling catheter is needed. The catheter should drain into a closed antiseptic bottle,[7] and in any event should be removed at the earliest opportunity.

There is still no antibiotic which can be relied upon to eliminate proteus and pyocyanea infections; after removal of an obstructive factor most infections tend to be self-limiting except these two. The paper by Garrod and his colleagues[1] starts with the remark that twenty-five years ago the only available urinary antiseptic was hexamine. This drug has been excluded from the present *National Formulary* on the grounds that it is unscientific; but when prolonged treatment is needed after the correction of an abnormality of the urinary tract it still has its advocates and its uses.

HUNTINGTON'S CHOREA

Huntington's chorea is one of the most distressing of all inherited diseases. The prolonged suffering of those affected, the disruption of family life, social and economic difficulties, the grim period of waiting through early and middle life for the dreaded signs of onset, the appalling risk (50%) that any child of a sufferer will himself develop the disease, and that, should he be married, he may have already passed it on to his children—all these considerations combine to present to those interested in medical genetics the unhappiest problems with which they have to deal. The new and careful survey reported by Dr. M. J. Pleydell in this issue is therefore particularly welcome, and especially so because it comes from a member of the public health service who puts forward practical suggestions which show how local health authorities, general practitioners, and mental hospitals could combine to help sufferers and their families, and which might indeed succeed in time in lowering the incidence of the disease in the community. In his own county of Northampton Dr. Pleydell has discovered eight families. If this incidence is typical of the country, there are more than 1,000 such family groups in England and Wales, so the problem is far from negligible numerically.

Huntington's chorea is due to a dominant gene, which is transmitted freely from generation to generation because the majority of those affected have had time to produce families before the disease appears. All surveys agree in showing that the gene has nearly always been received through a line of ancestors, and evidence that recent mutations may have occurred is only very rarely forthcoming. Bell's[1] useful table giving age of onset shows that in about 10% of patients the disease begins before the age of 20 years; in a further 20% it begins between 20 and 30, while some two-thirds of all those affected have developed their disease by the age of 40. If the fertility of those bearing the gene were the same, age for age, as in the community generally, we should expect a reduction in average total fertility, say, at a guess, by one-quarter. On certain simplified assumptions this figure can be linked to the expected mutation rate. About a quarter of the cases should be sporadic, coming from hitherto normal families. In about a further 20% the condition should be traceable no further back than one generation. Manifestly this is

[1] *The Treasury of Human Inheritance*, 1934, 4, 1. [5] *Science*, 1951, 113, 294.

not true: the fertility of the bearers of the gene must therefore be higher age for age than that of the general population. There is direct evidence of this. For example, Reed and Palm[2] found in their material that affected persons had had an average of 6.1 children as against the 3.3 of their unaffected brothers and sisters. The relatively greater fertility might be intrinsic, or, as Dr. Pleydell suggests, it might be a consequence of heightened sexual activity, possibly due to cortical degeneration, during the earliest stages of the disease. One other possibility should, however, be mentioned, though it can probably be safely dismissed: Huntington's chorea not infrequently remains undiagnosed, and possibly a solitary case is more likely to remain so than several cases occurring in a family. But, even so, thorough surveys fail to disclose the unrecognized sporadic cases that would lend support to this suggestion. The addition of new abnormal genes to the population is thus proceeding at a very slow rate, and the problem is almost entirely that of the passing on of the gene by the children of affected persons.

The practical measures which Dr. Pleydell suggests include systematic ascertainment of families, supervision and help in the problems which arise in the home, and, most important for the future, health education. It is remarkable how many members of the families concerned do not understand how the disease is transmitted. Sometimes those who have nothing to fear, the children of normal parents, spend lives of apprehension. Dr. Pleydell finds that explanation and advice are welcomed. He suggests that children of an affected parent, if Roman Catholics, should be advised against marriage. For others reference to a birth-control clinic may also sometimes be helpful. Termination of pregnancy should be considered if either parent is suffering from the disease or may be carrying it. Friendly supervision of choreic families should be maintained by whoever is best placed for carrying it out. Finally, when domiciliary care proves inadequate, the patient should be admitted to a mental hospital.

Perhaps some day means will be devised for distinguishing early in life between the children of affected persons who have received the gene and those who have escaped it. The latter could then be assured that they have nothing to fear and can freely marry and have children. Some years ago it was thought that electroencephalography might provide this invaluable test, but Dr. Pleydell, like others, finds that the claim cannot be substantiated. Nevertheless it may be that some day a method will be found, and this would be the best service of all which could be provided for choreic families.

HYPERCALCAEMIA IN INFANCY

"Feeding difficulty" used to be considered a sufficient diagnosis in paediatrics. It is still a useful term, but it is not used with the same confidence that it once was. Now when the physician has in his care infants suffering from prolonged vomiting and reluctance to feed he is apt to call to mind the possibility of metabolic disorders such as infantile renal acidosis or infantile hypercalcaemia. Hypercalcaemia may be produced by primary or secondary hyperparathyroidism, by excessive intake or sensitivity to vitamin D, by sarcoidosis and other diseases with infiltration of bone, or by overdosage with alkalis and milk,[1 2] but the cause of infantile hypercalcaemia is not known. Hypersensitivity to vitamin D[3] is an attractive suggestion, for response to its administration varies considerably in different individuals,[4] and Jeans[5] observed that a daily dose of only 1,800 units might retard growth, cause anorexia, and perhaps produce a dense deposition of calcium in the zone of provisional calcification.

These considerations are somewhat speculative: clinically, the physician has to deal with a baby who does not thrive and whose serum calcium and blood urea are increased. Symptoms begin between the third and seventh months with anorexia, vomiting, wasting, constipation, and hypotonia.[6] The urine is acid, contains a trace of protein and a few white cells but no constant organism on culture. Serum phosphate, phosphatase, and chloride are normal, but about one patient in five has acidosis. The α-2 and γ globulins are increased.[7] In mild cases recovery may occur in a few weeks, but it may be delayed for months, and in some there is renal damage and more serious interference with growth.[8] There may be evidence of renal calcification of the medullary type.[9] Some of the severe cases[10–15] differ from the others and may be diagnosed at a glance, for these patients all look alike, with epicanthus, a wide mouth, and low-set ears; they have the affronted, incredulous expressions of Pekinese dogs but are apathetic and miserable. A harsh systolic murmur (perhaps due to hypertension[16]) may be heard all over the praecordium and posteriorly, but maximally at the

[1] Burnett, C. H., *et al.*, *New Engl. J. Med.*, 1949, **240**, 787.
[2] Snapper, I., *et al.*, *Arch. intern. Med.*, 1954, **93**, 807.
[3] Lightwood, R., *Arch. franç. Pédiat.*, 1953, **10**, 190.
[4] Bicknell, F., and Prescott, F., *The Vitamins in Medicine*, 1942, p. 495. Heinemann, London.
[5] Jeans, P. C., *J. Amer. med. Ass.*, 1950, **143**, 177.
[6] Lightwood, R., *Arch. Dis. Childh.*, 1952, **27**, 302.
[7] Payne, W. W., ibid., 1952, **27**, 302.
[8] Creery, R. D. G., and Neill, D. W., *Lancet*, 1954, **2**, 110.
[9] Lightwood, R., *Proc. roy. Soc. Med.*, 1952, **45**, 401.
[10] Butler, N. R., ibid., 1951 **44**, 296.
[11] Fanconi, G., and Girardet, P., *Helv. paediat. Acta*, 1952, **7**, 314.
[12] Schlesinger, B., *et al.*, ibid., 1952, **7**, 335.
[13] Creery, R. D. G., *Lancet*, 1953, **2**, 17.
[14] Dawson, I. M. P., and Craig, W. S., ibid., 1954, **1**, 974.
[15] Lowe, K. G., *et al.*, ibid., 1954, **2**, 101.
[16] Lightwood, R., and Stapleton, T., ibid., 1953, **2**, 255.
[17] Lightwood, R., *British Medical Journal*, 1954, **2**, 304.
[18] Harris, L. C., *Arch. Dis. Childh.*, 1954, **29**, 232.

third and fourth intercostal spaces; the heart is not clinically enlarged. Lethargy and a raised blood cholesterol may lead to a diagnosis of hypothyroidism, but the facies is distinctive. In these severe cases the serum alkaline phosphatase may be low and the phosphate values fluctuate. Renal function is impaired. Radiographs of the skull may be distinctive, for condensation of bone round the orbits produces a picture which suggests that the baby was wearing goggles; the basis cranii is also dense and there are alternate translucent and dense bands at the ends of the long bones. Whether the severe form, with its distinct physical peculiarities, differs essentially from the milder type is problematical. At first sight it appears to, but now that cases have been observed over considerable periods it seems not quite certain; the two may be related, and we must hope that further studies will tell.

The management of these infants requires great patience, for it may take an hour to feed one, and fifteen minutes afterwards the entire feed is often vomited. Theoretically sodium ethylene-diamine tetra-acetate (E.D.T.A.) might be used to eliminate calcium, but it may be dangerous,[17] and it seems better to give a low-calcium diet based on an imitation of milk. This may have no effect on the primary abnormality—and indeed there is no dramatic correlation between serum calcium and clinical condition—but prolonged hypercalcaemia is harmful in itself. Whether cortisone[8] has a place in treatment is still uncertain. Sulphonamides should not be given for long periods, since in three cases an increase in the azotaemia and in one case a rise also in the plasma phosphate occurred.[18] Vitamin and iron intake have to be watched, as in all cases of "feeding difficulty," but supplements of vitamin D should be forbidden.

RESULTS OF PARTIAL GASTRECTOMY

The results of operation for gastric and duodenal ulcer are apt to show certain differences, and even when a similar type of operation is done for both sorts of ulcer there may be objections to grouping them together for a follow-up study. Whatever may be said against the term "peptic ulcer," it is no doubt true that when an operation is recommended for this condition a partial gastrectomy is most often performed. The increasing practice and decreasing mortality of partial gastrectomy have not unnaturally enhanced interest in the various unpleasant sequelae of the operation. Sometimes undue attention is paid to them, with a consequent tendency to forget that when surgical treatment is strongly indicated the result is satisfactory in most cases. The best results are obtained when the surgeon is not too "light on the trigger" and when there is a good measure of agreement with the physician on the indications for operation. The report by Professor Charles Wells and Mr. Ian W. MacPhee at page 1128 of the *Journal* this week records their observations on a group of peptic ulcer cases studied ten years after operation. These authors concentrate on certain sequelae, such as bilious vomiting, loss of weight, and anaemia, occurring in a relatively small and highly selected series of patients treated by a variety of operations.

Poor results follow gastrectomy in about 5% of cases, and may be attributed partly to the surgeon, partly to the patient, and partly to intercurrent disease. The surgeon may be responsible through careless selection of cases or faulty technique, and the patient through psychological maladjustment and failure to cultivate the right philosophy. Many of the latter should be weeded out before operation by the discerning surgeon, and he may sometimes be faced with the problem of deciding whether operation should be deferred or denied. Intercurrent disease is well recognized as likely to conduce to poor results, for a person already invalided by some other disease is frequently intolerant of post-gastrectomy disability or discomfort. Chronic bronchitis ranks high on the list of such intercurrent troubles. As to what constitutes a poor result, persistent bilious vomiting and other manifestations of the so-called dumping syndrome, such as nausea, post-prandial distension, and sweating, are the commonest reasons for disappointment. Stomal ulceration, once a major problem of ulcer surgery, is certainly a very uncommon complication of the modern operation for partial gastrectomy. Indeed, Tanner[1] states that he has never seen recurrent gastric or stomal ulcer following partial gastrectomy for gastric ulcer in his own cases. Such cases as are encountered after a high partial gastrectomy usually follow operations for duodenal ulcer; but, even so, the incidence does not exceed 1–2%. After more limited gastric resections or gastroenterostomy, even when this is combined with vagotomy, the incidence of recurrent ulceration is higher.

Whereas more extensive resections protect the patient from recurrent ulcer, many surgeons believe that the less dangerous but distressing sequelae referred to are more prominent after the most radical operations. Unfortunately, all too few surgeons keep accurate measurements of the gastric remnant or, in a Polya type operation, the length of the afferent loop, and it can be most difficult to correlate post-operative symptoms with the type of operation performed. Pulvertaft,[2] reporting on the late Hedley Visick's cases, stated that regurgitation was a little less common and other features of dumping a little more common after the very high "measured radical gastrectomy." Valid evidence is meagre on the relative merits of antecolic and retrocolic varieties of the Polya operation, though some surgeons are rather dogmatic in their advocacy of one or other procedure.

Microcytic hypochromic anaemia is not uncommon after the Polya operation according to some authorities, but Norman Lake,[3] from his extensive experience of the operation, concluded that anaemia of this type is not often seen. Loss of weight occurs in an appreciable

[1] *British Medical Journal*, 1953, 2, 841.
[2] *Lancet*, 1952, 1, 225.
[3] *British Medical Journal*, 1948, 1, 285.
[4] Ibid., 1953, 1, 985.
[5] Ibid., 1954, 2, 160.

number of patients. Wells and MacPhee state that rather more than 25% of patients fail to regain their pre-operative weight, while about 50% remain below their best weight in normal health. Pulvertaft[2] reported likewise, and here again the most radical operations resulted in a higher incidence and degree of weight loss. In many patients this loss of flesh occasions no bother and is indeed an advantage if they have previously fattened on a milk diet. Perhaps related to this weight loss is a decreased resistance to pulmonary tuberculosis, which has been mentioned as possibly more common in the gastrectomized subject,[2] but certain evidence is still lacking on this point.[1 4] It is often said that the mortality of elective gastrectomy for peptic ulcer should not exceed 2% in good hands, but this contention is sometimes based on rather carefully selected series, and the mortality for the country as a whole may well be higher. Operative mortality is still an important consideration, and, as Professor C. F. W. Illingworth has suggested,[5] with the decreasing risks of perforation and haemorrhage, partial gastrectomy could be one of the major mortality risks of the patient with peptic ulcer.

The family doctor sometimes finds it most difficult to resist his patient's demand for early operation, especially if the latter has been impressed by the excellent results enjoyed by other sufferers. Some may therefore be tempted to feel that the importunate patient should not be resisted, and that the production of a certain percentage of chronic post-operative grumblers is a small price to pay for the striking relief of the majority. However, it is surely desirable to keep the former down to an absolute minimum, and, small though the mortality is, to run the risk of operation only when it is clearly justified. The thoughtful surgeon, bearing all these points in mind, may, when he counsels a longer trial of more conservative measures, sometimes find himself in opposition to patient, family doctor, and consultant physician. At the same time, undue preoccupation with the poor results and fear of reproducing them may lead to many a worthy sufferer being denied operation. All concerned with the care of the patient look at this problem from a different vantage point, and here notably it is only by an understanding of each other's problems that doctors can help their patients to get the best from surgery.

OESTROGEN DETERMINATION

Although a fair amount of knowledge has been accumulated about the major fluctuations in oestrogen production in normal and abnormal conditions, much of the factual data has been obtained by methods of oestrogen determination which are now known to be far less than adequate. Until comparatively recently bio-assay, with its considerable difficulties and shortcomings, was the only kind of procedure available for assessing the oestrogen content of body fluids. It is true that the Kober reaction for oestrogens had been used for their chemical estimation in urine from pregnant women, but, except in pregnancy, the quantities of oestrogen involved are so minute that this reaction was found to be hopelessly insensitive, as well as subject to marked interference by non-specific chromogens. Moreover, until recently, few attempts had been made to separate the oestrogens, which were consequently measured as "total oestrogens," a value of doubtful significance. But the work which is being done in this field is progressing, and several advances were described at a symposium on the technique and significance of oestrogen determinations held earlier this year at the Royal Society of Medicine, the Section of Endocrinology and the Society for Endocrinology being joint participants. Two workers from Edinburgh, Brown and Bauld, have independently elaborated techniques for the extraction, separation, and purification of oestrone, oestradiol, and oestriol from the urine of non-pregnant women and their estimation by a modification of the Kober reaction. The results obtained by these two workers on aliquots of the same urine show remarkable agreement. Brown has now carried out daily oestrogen determinations over several menstrual cycles in different women and has shown quite clearly that, typically, there are two oestrogen peaks—one occurring close to the time of ovulation and the second towards the latter part of the secretory phase. The oestriol peak always occurs a day or two after the oestrone peak, and Bauld has shown that when oestradiol is administered to patients the same time lag is apparent in the resulting increased oestrogen excretion.

Other methods for oestrogen separation and determination were also described. Braunsberg, Stern, and Swyer use a chromatographic technique for separating the three oestrogens on a single celite column and then make use of the Finkelstein, Hestrin, and Koch reaction with phosphoric acid for the fluorimetric measurement of oestrogens. With their existing apparatus they can measure accurately as little as 0.01 μg. of oestradiol, 0.02 μg. of oestrone, and 0.05 μg. of oestriol. Another method of separation, which Diczfalusy has used, involves countercurrent distribution. All these procedures are difficult and time-consuming, and they should still be regarded as research techniques, as yet quite unsuitable for routine use. Moreover, determination of the excretion of oestrone, oestradiol, and oestriol gives only very partial information about oestrogen metabolism. Making use of paper chromatography techniques, Boscott has shown how many other possible oestrogen metabolites may be present in urine. It is in fact not unlikely that the three so-called principal "oestrogens" may be only relatively minor representatives of all the oestrogen metabolites. The subject is still very much in its infancy, and a great deal more work must be done, and many years must pass, before the end of the story is told.

Of what immediate value then, it may be asked, are these researches to the practising clinician? The answer is quite certainly very little. The accurate estimation of oestrogen concentrations, either in the urine or even in the blood, has no present application as an aid to diagnosis or prognosis. Purely clinical techniques, such as endometrial biopsy and vaginal smears, are probably quite adequate at the moment, and the time has not come for gynaecologists to request chemical pathology

laboratories to do oestrogen estimations for them, nor should they expect research laboratories to deflect their energies from legitimate investigations to carrying out isolated oestrogen determinations.

CHANGES IN MENTAL HEALTH SERVICE

The London County Council is proposing to give evidence to the Royal Commission on the Law relating to Mental Illness and Mental Deficiency in the form of twenty-five recommendations. Many of these have far-reaching implications and deserve careful scrutiny. The first and most important is that all persons of unsound mind should in the first instance be admitted to an observation unit, which should not be part of a mental hospital. The ideal arrangement would be for all patients to be seen by a psychiatrist before removal from their home, but this is not normally feasible, though such a scheme exists in Amsterdam.[1] Admission to an observation ward would often avoid the need for certification. It is estimated that the present provision of observation ward accommodation in London (217 beds in four general hospitals and one teaching hospital) would be sufficient for the needs of London if all elderly patients (over 65) were referred, not to observation units, but to special geriatric units, unless they were so grossly disturbed as to require immediate psychiatric care. The county council is also of opinion that future planning of hospital requirements should include neurosis hospitals or units separate from, although grouped for staffing purposes with, mental hospitals. Meanwhile patients suffering from neuroses who needed to be admitted to mental hospitals should be admitted without formality and should so far as possible be kept separate from psychotic patients.

Many recommendations are made on the treatment of mental defectives. The county council suggests that feeble-minded persons should be accommodated at institutions separate from those for the lower grades, and that their cases should be subject to review at yearly intervals; also that the continuation of institutional care for defectives accommodated with the consent of their parents should be effected by the issue of a certificate in appropriate terms by the medical officer of the institution. Formalities connected with the admission to institutions of defectives whose parents desire it should be reduced to a minimum, and in such cases discharge should be arranged at the parents' request. Power to discharge should be vested also in hospital management committees. The L.C.C. also recommends revision of certain terms of speech. The term "supervision" should be discontinued and replaced by "community care." The terms "idiot" and "imbecile" should be abandoned and both these classes might be described as "mentally defective persons," while "mentally subnormal persons" should take the place of "feeble-minded persons." The term "moral defectives" should be discontinued; no person can come within that definition unless he also falls within one of the other classes.

[1] See *British Medical Journal*, **2**, 1043.

A NEW ORAL DIURETIC

No one doubts the value of mercurial diuretics in the treatment of patients with fluid retention: their main disadvantage is that they must be given by injection, though an oral preparation has recently become available.[1] A new approach to research on diuresis was suggested by the observation that sulphanilamide was a specific inhibitor of the enzyme carbonic anhydrase.[2] This enzyme is present in many tissues—for example, red blood corpuscles, gastric mucosa, pancreas, lungs, brain, and kidneys—and accelerates the combination of carbon dioxide with water to form carbonic acid. In the renal tubules carbonic acid is ionized to hydrogen and bicarbonate ions, and this reaction is indirectly dependent on the presence of carbonic anhydrase. Hydrogen ions take the place of the sodium in the glomerular filtrate, thus acidifying the urine and conserving base.[3] The formation of ammonium ions, likewise "base-sparing," also depends on the supply of hydrogen, and Berliner[4] has shown that potassium competes with hydrogen in the renal tubules. Inhibition of carbonic anhydrase activity, by causing a deficiency of hydrogen ions, will therefore result in the secretion of an alkaline urine, rich in sodium, bicarbonate, and potassium.

Schwartz[5] showed five years ago that sulphanilamide would cause a diuresis in patients with congestive cardiac failure, and since then a search has been made for a more powerful and less toxic carbonic anhydrase inhibitor. Acetazoleamide ("diamox"), a heterocyclic sulphonamide discovered and investigated in the laboratories of the American Cyanamid Company, appears to be a powerful diuretic. Clinical reports[6 7] show that it is capable of causing a diuresis in patients with cardiac failure when given in a single daily dose of 250–750 mg. by mouth. Larger doses have no advantage, and when oedema has disappeared reaccumulation of fluid can often be prevented by taking the drug every second or third day. In more severe cases acetazoleamide may potentiate the effect of mercurial diuretics, but it should not be given with ammonium chloride. Side-effects—drowsiness, paraesthesiae, and occasionally disorientation—are relatively slight. Acidosis and potassium deficiency might be expected, but these are mild in degree and are prevented by intermittent treatment, because the effect of one dose lasts about six hours only, after which carbonic anhydrase activity begins to return. The drug is most useful in congestive cardiac failure; results in portal cirrhosis and nephrosis have so far been equivocal, but it is certainly worth an extended trial in these conditions. It has interesting theoretical possibilities, not only as a diuretic but also in the treatment of conditions as diverse as peptic ulcer, emphysema, hyperpotassaemia, epilepsy, and migraine. Further work will crystallize its therapeutic value; it is already proving a most important research tool because of the wide distribution of carbonic anhydrase in the tissues.

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[2] Mann, T., and Keilin, D., *Nature* (*Lond.*), 1940, **146**, 164.
[3] Pitts, R. F., *Arch. intern. Med.*, 1952, **89**, 864.
[4] *Amer. J. Med.*, 1951, **11**, 274.
[5] *New Engl. J. Med.*, 1949, **240**, 173.
[6] Friedberg, C. K., Taymor, R., Minor, J. B., and Halpern, M., ibid., 1953, **248**, 883.
[7] Belsky, H., ibid., 1953, **249**, 140.

PHYSIOLOGY OF MEMORY

THE MAUDSLEY LECTURE

The 29th Maudsley lecture of the Royal Medico-Psychological Association was given on Thursday, November 4, at the Royal Society of Medicine by Professor WILDER PENFIELD, O.M., F.R.S., with the association's president, Dr. NOEL HARRIS, in the chair. Professor Penfield is director of the Montreal Neurological Institute, and until recently was professor of neurology and neurosurgery at McGill University. His subject was "The Role of the Temporal Cortex in Certain Physical Phenomena."

Professor Penfield said that surgeons suffered from inferiority feelings before physicians, and this was the first time he had ever addressed a psychiatric gathering. However, he had been a student of psychology before he took up medicine, and had been an undergraduate under Adolf Meyer at Johns Hopkins. It was his life's ambition to elucidate what Henry Maudsley years ago, with his far-sighted vision of the future of psychiatry, had called in the title of a book "The Physiology and Pathology of the Mind." In the present lecture he wanted to discuss observations on the permanent ganglionic record of life's experience, the physiology of memory whereby what William James called "the stream of consciousness" was indelibly recorded moment by moment. These recordings could occasionally be reactivated by electrical stimulation of the temporal cortex under local analgesia, or naturally came briefly into consciousness during certain epileptic fits.

Streams of Remembrance

Such reactivations were like strips of talking cinema film. Everything, all the external and bodily sensations together with their understanding of a moment of past time, was re-experienced by the individual, probably exactly as it had originally been. The action went forward as long as the stimulation proceeded, was independent of the rate of stimulation (usually 60 shocks per second), stopped when the shocks stopped, restarted again at the beginning when the experiment was repeated. There was only a single stream of remembrance produced at any one stimulation position, so perhaps somehow other lines of thought were simultaneously inhibited. It was unidirectional in time—it never went backwards. The patient never experienced any mental confusion. The only part of the cortex which on electrical stimulation yielded these organized perceptional illusions—what Hughlings Jackson had called "the dreamy state" in certain types of (temporal lobe) epilepsy—was the temporal lobe.

Operations on the temporal lobe had come to be the largest part of all surgery for the relief of epilepsy and provided the opportunity for these stimulation experiments. With coated electrodes, points deep in the lobe or on its mesial surface could be stimulated, and it was soon clear that only the stimulation of the grey matter led to these complex and involuntary recollections. Further, it was only the grey matter of certain areas near the tip of each temporal lobe which so responded. The uncus and the hippocampus, for instance, were quite unresponsive, although patients suffering from temporal lobe epilepsy were most frequently found to have lesions of these zones—a result of compression in the incisura of the tentorium during birth. Stimulation deep in the Sylvian fissure led to auditory sensations such as buzzing, never to experiential or interpretative illusions. Shocks to the insula produced alimentary tract sensation, to the deep temporal tip head and body sensations, and so on.

Recorded Extracts

Professor Penfield quoted some case histories. One was a stenographer whose epileptic attacks took the form of bodily sensations, automatic movements, and loss of memory for the details of the attack. When a particular area of her right temporal lobe was stimulated she heard an orchestra playing a certain song and was convinced there was a gramophone in the operating theatre. Each time the experiment was repeated she heard the same orchestra and the same music. The orchestra's tempo was independent of the stimulation rate, and the song was not one she knew very well or had any special interest in. Another case was of a man who on stimulation thought he was talking and laughing with some cousins in South Africa, but at the same time seemed to know he was in the Montreal operating theatre. Such recollections were always accepted as familiar, as part of his life, by the patient, though they were beyond voluntary recall and probably differed from voluntary memories, and perhaps those of psycho-analysis, in being completely unmodified by any judgment or comparisons. They were random memory samples, without particular significance for the individual, merely accidental pieces from the complete recording of his waking life.

The spotlight of consciousness, the speaker suggested, played on the subcortical nuclei of the higher brain stem, picking out a sequence of sensations and impulses in this zone of central integration. A sequence of impulses passed out from this zone to the cortex of both temporal lobes, and in so doing altered the pathway it took, making a series of facilitations so that years later when the cortical point was stimulated the same pathway was activated again, and the same moment of the stream of consciousness re-created at the centre. Each memory was probably bilaterally represented (in *both* temporal lobes, that is), since unilateral lobectomy did not affect it unless the other lobe were also damaged.

Symptoms in Temporal Lobe Epilepsy

Since Hippocrates gave the lead over 2,000 years ago the study of natural epilepsy had been available to throw light on the mechanism of the mind. There were three types of temporal lobe epileptic symptoms seen—the experiential (the hallucination of past experiences, the flashback like the memory strip produced by stimulation), the interpretational (*déjà vu* or false familiarity, false strangeness, feelings of things receding or coming nearer, isolated emotions such as fear, loneliness, sadness, without relevance to the situation or overall mood of the patient), and amnesic or confusional. The first kind of symptom seemed to be an abnormal reactivation of memory. The second was an abnormal interpretation of current events (presumably through abnormal comparisons with memories of past events); while in the third, the memory-making mechanism failed to act and the patient went through a phase of automatism of which he knew nothing.

Professor Penfield quoted illustrative cases. In one, a man was prone to attacks which began as dizziness, feelings of familiarity (*déjà vu*) and fear, and proceeded to automatic behaviour and a brief unconsciousness. At operation a point was found at a depth of 2 cm. in the first temporal convolution of the right lobe which if sufficiently stimulated resulted in an epileptic discharge—as shown by the electrocorticogram. Stimulation was at once stopped and the seizure and after-discharge allowed to run, when the patient spontaneously remarked, "That bitter-sweet taste on my tongue," made licking movements, then said, "Oh God, I'm leaving my body," and looked terrified, and subsequently became normal again. If the initial stimulation were inadequate to fire off the fit (as shown by the E.Co.G. tracing), then none of this happened. In another case, in which there had been minor fits for five years and major fits for three years, the aura consisted of thoracic sensations, sounds seemed louder and faster (if there were sounds to be heard), and thoughts and words came spontaneously into consciousness.

As for automatism, with failure of the recording apparatus of the brain, this could be reliably produced by stimulating at a point 4 cm. from the tip of the temporal lobe and 4 cm. deep to its lateral surface, in the neighbourhood of the amygdaloid nucleus, provided only that the stimulation were intense enough to provoke a seizure and after-discharge.

Thus far went the facts at present. Speculation ought to be cautious and clinicians were often reckless. It was

curious that Henry Maudsley and Hughlings Jackson were both Yorkshiremen born in 1835 who never referred to one another in their writings, so far as Professor Penfield could trace. He felt sure that Maudsley would, however, have been very critical of Jackson for the hypotheses he built on clinical observation, and this excused him from any but the briefest theoretical interpretation of the findings.

Professor F. L. GOLLA proposed a vote of thanks.

IMMUNIZATION AGAINST VIRUS-A INFLUENZA

ARRANGEMENTS FOR TRIAL OF VACCINES

The following statement about the field trial of influenza vaccines in England, Wales, Scotland, and Northern Ireland has been received from the Ministry of Health.

As the result of consultations between the Ministry of Health and the Medical Research Council, a Committee on Clinical Trials of Influenza Vaccine was formed by the Council in 1951 to carry out and co-ordinate further inquiries. This was necessary as the investigations conducted previously had met with only varying degrees of success owing to changes in the virus antigens and to difficulties in ensuring that the vaccine provided was suited to the particular strain causing the epidemic.

Serological trials in the winter of 1951–2 resulted in the committee being able to stage in 1952–3 a large-scale field trial of a vaccine containing equal proportions of FM (a virus A strain originally recovered in 1947 in the U.S.A.) and the Liverpool strain, which had been responsible for the epidemic in early 1951. A control "anti-influenza" vaccine was also used. Some 13,000 volunteers were involved in the main trial in centres scattered throughout the United Kingdom.

The extent of influenza A in the winter of the trial was very limited, but it was clear that there was a 40% reduction in clinical influenza in the trial group as compared with the control. A detailed report on the trial was published in the *British Medical Journal* of November 28, 1953, p. 1173.

The results were encouraging and the committee decided to go forward in the search for still more efficient vaccines.

In view of the favourable reports received from the U.S.A. of the increased antigenic value of the oil-adjuvant as distinct from the saline type of vaccine a comparative serological trial was commenced in December, 1953, in groups of volunteer students in certain London hospitals and in Manchester and Sheffield. This trial is now almost complete and has demonstrated the much greater efficiency of the oil-adjuvant vaccine in antibody production in the first six months after inoculation compared with the saline vaccines. At the same time, reactions either local or general from the oil-adjuvant vaccines have been almost negligible and even less than those experienced with the saline vaccine.

Forthcoming Field Trial

In view of the possibility of outbreaks of virus A influenza in the coming winter the committee decided that a further large-scale field trial should be carried out, and some 16,000 individuals have volunteered in industrial and similar organizations in certain centres throughout England, Wales, Scotland, and Northern Ireland. Three vaccines—one saline and two oil-adjuvant—all from the England 1954 A strain, will be under comparative trial, with a fourth (virus B) vaccine as a control. Equal numbers of the volunteers in each centre will be inoculated with the vaccines, and special supervision will then be kept on them for four months, in the hope that in the event of any of the centres being attacked by influenza it will be possible to assess the relative preventive values of the vaccines under trial.

Detailed instructions have already been circulated to all concerned in the various volunteer centres, and the inoculations are to be carried out between November 22 and December 4 next. The vaccines will be distributed just prior to the former date.

Co-operation of General Practitioners

The responsibility for the treatment of illness occurring in the observation period of four months lies with general practitioners concerned, and it is unnecessary to emphasize the importance of as close a liaison as possible between such practitioners and the industrial and other medical officers concerned in the trials. As accurate a diagnosis as possible between true influenza and other upper-respiratory infections with a winter prevalence is also essential.

Under the arrangements made it will be known to any general practitioner who is asked to attend a volunteer during the observation period that the patient is in fact a volunteer and to which centre he belongs. It is hoped that all general practitioners seeing such volunteers will then co-operate in the investigations by filling in the simple record form with which they will be provided.

The medical officers of health in the areas in which the trials are being carried out will be able to help in a variety of ways and will in particular be able to keep those concerned in the volunteer centres informed as to the occurrence of influenza and the progress of any outbreak which attacks the area. For this purpose medical officers of health in whose areas there are volunteer centres have been given the details of these.

An important innovation in this year's vaccine trial is that special arrangements are being made in the main trial areas to detect the presence of influenza. In each of these areas a number of practitioners have agreed to take specimens for laboratory examination from suspected cases of influenza every week for the duration of the trial. In this way it is hoped to determine the probable date of appearance and disappearance of influenza in the areas in which the volunteers live, and to learn whether any outbreak is due to virus A or virus B.

These trials can succeed only if there is the fullest co-operation between all concerned, and the Ministry of Health and the Medical Research Council have every hope that this will be forthcoming. If more detailed information is required reference should be made to the secretary of the Medical Research Council Committee on Clinical Trials of Influenza Vaccine, at the Ministry of Health, 23, Savile Row, London, W.1 (telephone: REGent 8411, ext. 91).

TREATMENT OF POLIOMYELITIS

AN ORTHOPAEDIC PROBLEM

The British Orthopaedic Association has prepared the following memorandum on the treatment of poliomyelitis.

Sporadic poliomyelitis has been recognized in Great Britain for 150 years. The first recorded epidemic did not, however, occur until 1911, when there was a sharp local outbreak in Devon and Cornwall. Other local epidemics followed at intervals, but in 1947 there was a widespread outbreak when over 7,000 cases were notified. Since then further similar outbreaks have occurred, and the British Orthopaedic Association is concerned about the arrangements for dealing with these large-scale epidemics.

Before the first world war orthopaedic surgeons usually saw patients with poliomyelitis only after deformity had developed. They appeared in out-patient clinics as cripples who required operative correction of deformities that had developed as a result of loss of muscle balance. It is known that many of these deformities could have been prevented by adequate early treatment and regular supervision over a period of years. Legislation such as the Fisher Act of 1918 encouraged the development of clinics and special hospitals for young "cripples," with the result that children who had suffered from poliomyelitis came under more

comprehensive supervision and treatment. Useful links were formed in many parts of the country between orthopaedic and infectious diseases hospitals; orthopaedic supervision was instituted in the acute stage of the disease; and continuity of treatment was ensured when the patient was transferred either to the orthopaedic hospital or to his home. In consequence there was a striking improvement in the condition of patients who had suffered from poliomyelitis, and the orthopaedic surgeon was able to confine his surgical activities to reconstructive as opposed to corrective operations.

Revision of Existing Arrangements

The recent increase in numbers of cases of poliomyelitis demands revision of the arrangements which had worked well up to 1947. The parallel increase in bulbar and respiratory complications—which have probably always been present in about one-third of the paralytic cases—has led anaesthetists and laryngologists to take an active part in the management of the acute disease, an interest which is extremely welcome to the teams with which they have worked for many years past.

It is, however, with some concern that the British Orthopaedic Association detects a tendency to jettison the clinical and administrative experience slowly gained over several decades. It appears that the undoubted need for skilled attention and special equipment in the care of patients with bulbar and respiratory paralysis has led to suggestions that patients suffering from poliomyelitis should be admitted to hospitals where these special facilities predominate rather than to infectious diseases hospitals where a full team is available. The association feels bound to emphasize that in view of the recent evidence of increased infectivity of poliomyelitis there is a danger that such a policy may in fact materially aggravate the incidence of the disease.

Special Centres at Infectious Diseases Hospitals

The association therefore suggests that it would be preferable to improve and expand facilities for the treatment of acute complications of poliomyelitis without placing the welfare of the individual above that of the community. A reasonable way of doing this, which has already been adopted in certain regions, is to select suitable infectious diseases hospitals as centres for the reception of patients suffering from poliomyelitis, to equip them with the facilities required by the specialist responsible for dealing with dangerous complications, and to staff them with a team which will also be available outside the hospital. In this way proper isolation is secured, and transfer of patients at the stage of the disease when ordinary transport by ambulance may endanger life would be avoided.

The infectious diseases hospital has yet another advantage in that it has no waiting-list at any time of the year; there are always facilities for immediate admission, and there is none of the awkward delay and dislocation of work which is inevitable when a special unit has to be opened temporarily to deal with an epidemic or a particularly difficult case. Infectious diseases hospitals can easily be linked administratively with large general hospitals, thus avoiding the creation of a special staff which might be unemployed for long periods.

Early Orthopaedic Treatment

The arrangements which exist in many parts of the country whereby the appropriate orthopaedic surgeon is informed immediately of the admission of a patient with poliomyelitis to the infectious diseases hospital enable the orthopaedic department or hospital to adjust its admissions so that there is no undue accumulation of patients in the infectious diseases hospital. They ensure, moreover, that there is adequate early treatment of the paralysis during the most important initial stages when contractures often develop rapidly, and they lead automatically not only to continuity of treatment and rehabilitation throughout the whole phase of recovery but also to the patient's training and settlement in a suitable occupation. It is suggested that this plan whereby the orthopaedic services are engaged from the beginning should be adopted on a national basis.

The British Orthopaedic Association is disturbed by the recent tendency to regard the potentially lethal aspects of the disease as predominant in the determination of the plan of treatment. Life is more important than limb, but poliomyelitis is still above all things a crippling disease. Limbs as well as lives have to be saved. Every patient should have the benefit of the special skill of the infectious diseases physician, the orthopaedic surgeon, and of specialists qualified to deal with the respiratory complications. They can work together in harmony everywhere, as, fortunately, they do now in many centres and regions.

Preparations and Appliances

THE HUDDLESTON NURSING HOIST

Dr. J. H. HUNT, general practitioner, London, writes: "In 1950 a patient under my care—6 ft. 2 in. (188 cm.) in height and weighing over 15 stone (95 kg.)—developed a cerebral tumour. Quite soon he was bedridden and incontinent, requiring constant nursing care. He was treated at home, and his size and weight made nursing difficult. Four nurses were needed, his wife giving what extra help she could day and night. When the patient died, after many weeks, his wife determined to devise some form of nursing hoist suitable for use in a patient's home, to help others in a like predicament. The "Huddleston hoist" is the outcome of three years of her work, with a little advice and help from others.

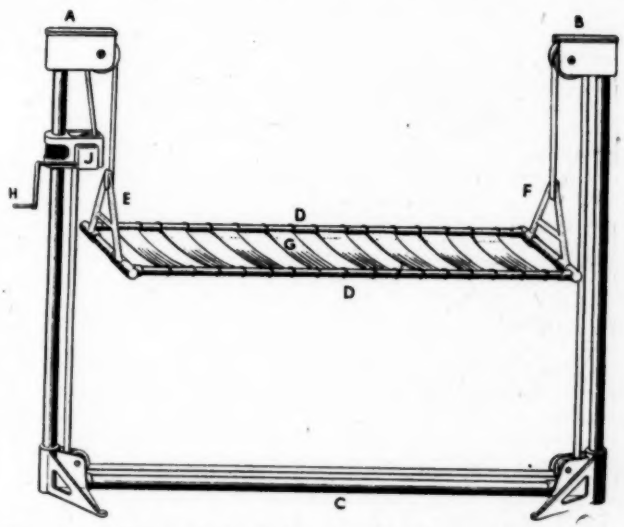


FIG. 1.—Diagram of the hoist. A=Upright at foot of bed. B=Upright at head of bed. C=Bar joining uprights. D=Metal side-pieces of stretcher. E and F=Triangular end-pieces. G=Webbing bands. H=Handle. J=Gear-box.

This hoist should fill a long-felt want for a simple and effective means of nursing *single-handed*, at home or in hospital, a patient whose weight or helplessness would otherwise make this impossible. It is portable, and can be used with any type of bed—from that in a small cottage to that in a hospital ward—so long as there is a clearance of 4 in. (10 cm.) off the ground. With low beds blocks may be needed.

This hoist has been subjected to a proof-loading test of up to 25 stone (160 kg.). It is made in four parts: (1) an upright which stands at the head of the bed; (2) another upright at the foot; (3) a bar under the bed connecting the two; and (4) a webbing stretcher with metal side-pieces

(Fig. 1). All four parts are light enough to be lifted easily, and they are assembled without tools. The stretcher side-pieces lie on the bed, one on each side of the patient; they connect with triangular head- and foot-pieces suspended from the uprights. Webbing bands, 5 in. (12.5 cm.) wide, are fixed to one of the side-pieces; these bands have "slipper" ends and are passed under the patient and hooked to the other side (Fig. 2); their length and position can be adjusted to the needs of the patient; they can be padded with cloth, or "dunlopillo" strips; they can be removed in an instant and are washable. Modifications will be introduced where needed.

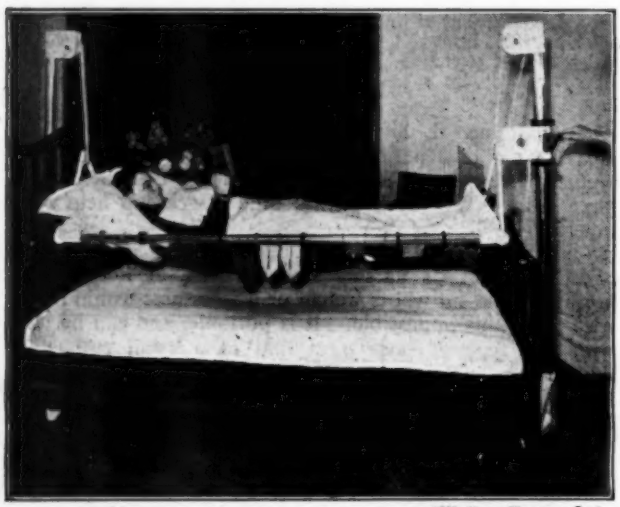
On this skeleton stretcher the patient can be gently raised, well clear of the bed, by a nurse turning a handle (Fig. 3). The gearing is such that this handle can be turned easily with one finger, however heavy the patient, and it is self-locking in any position. With the patient comfortably raised, the mattress can be turned and the bed aired; changing a draw-sheet, back washing, or giving a bedpan become simple operations which one person can manage. The patient, meanwhile, is given a change of position and pressure areas are relieved. If necessary the stretcher can be raised tilted with the head up (helpful in cardiac failure) or with the legs up.

In cases of severe paralysis or rheumatism, and fractures in plaster-of-Paris, in the helplessness of generalized cancer or old age, and in many other conditions, such a hoist can benefit the patient, his relatives, and his nurse. It is a means by which the smallest nurse can lift the heaviest patient by herself and with the greatest ease.

The sole suppliers of this hoist are Messrs. John Bell and Croyden, Wigmore Street, London, W.1. It may also be hired.

[*Nursing Mirror Photograph*

FIG. 2.—Details of metal side-piece and clips and the "slipper" end of a webbing band.



[*Wallace Heaton, Ltd.*

FIG. 3.—The hoist in use raised 12 in. (30 cm.) off the bed.

Correspondence

Because of the present high cost of producing the Journal, and the great pressure on our space, correspondents are asked to keep their letters short.

Sickling and Malaria

SIR,—Drs. R. A. Moore, W. Brass, and H. Foy (*Journal*, September 11, p. 630), claim to have produced evidence against Allison's[1] hypothesis that the sickle-cell trait offers some protection again falciparum malaria. Such evidence must be weighed against the essential theme of Allison's article, which is that "the abnormal erythrocytes of individuals with the sickle-cell trait are less easily parasitized by *P. falciparum* than are normal erythrocytes. Hence those who are heterozygous for the sickle-cell gene will have a selective advantage in regions where malaria is endemic."

The exact mechanism of this selective advantage in any region has not yet been worked out, for it is extremely difficult to collect the necessary data. Ideally, one should know the exact cause of all deaths before reproductive age in a malarious community in which the sickling state of each individual is also known. This is practically impossible, and therefore indirect methods have been used. Of several possible approaches, Foy and his colleagues have employed two. First, they have chosen two neighbouring communities of different sickle-cell rate, and shown that they present identical parasite rates. Their figures are for adults and children mixed; but, disregarding this source of error, there remains the serious objection that a mere figure for malarial incidence is of little relevance to the argument, for it gives no information as to the severity, and hence the selective effect, of malaria. Sickling of the erythrocytes (as I hope to show elsewhere) does not protect against the establishment of a falciparum infection, but it does limit the extent to which that infection may develop; parasite counts in sicklaemic children with falciparum malaria are very significantly lower than in normal children with malaria. Life is only endangered when the count is high, hence no assessment of the selective effect of malaria is valid unless this factor of severity is taken into account. Gross parasite rates may be equal in two communities, yet malaria may be eliminating non-sicklers more rapidly in one than in the other, and since the situation is a dynamic one there is no reason why at any moment the sickling rates should be the same. It is true that Allison[2] used variations in sickling rates in different places to show that the degree of malarial endemicity (he used the term "severity," which is hardly justified by the context) is an important factor in determining the frequency of the sickle-cell gene. But if one consults the records of sickling rates in Central Africa—conveniently summarized in A. E. Mourant's *The Distribution of the Human Blood Groups*[3]—one can easily extract examples to support either his view or its opposite. In fact, the situation is both complex and dynamic; original differences in gene frequency, established by large population movements[4] or by local genetic drift[5] may be at different stages of adjustment to the selective influence of malaria. The observations on the two Nyika communities do not disturb this hypothesis.

Secondly, the authors compare the sickling rates in parasitized and unparasitized persons in each of the two communities, and obtain about the same figure for each. But no difference need be expected in the absence of any measure of the severity of the malaria. Many workers, however (quoted by Allison[1]), have found a difference, though it did not reach conventionally significant levels (Allison's acceptance of Beet's[6] results is not borne out by calculation from the original data). I have examined 1,200 children under 10 presenting for any reason at a Kampala hospital; 73 out of 191 sicklers, and 494 out of 1,009 non-sicklers were infected with *P. falciparum*, a difference in favour of the sicklers for which $\chi^2 = 7.39$ for 1 d.f. Taking this in connexion with parasite counts, which was also recorded, I think the difference arises because an automatic selection has occurred—infected sicklers reaching hospital in relatively fewer numbers because their infections were much less severe. Evidence will be given on this point later, but it is to be noted that very large numbers have to be examined before the difference becomes apparent at an acceptable level. It is therefore not surprising, in the much smaller series of Foy and his colleagues, of mixed adults and children, undifferentiated either by natural or numerical measures of severity of malaria, that no apparent difference emerges.

Finally, it should be recorded that the authors' undocumented quotation of my results in the Baganda tribe must have been derived from information obtained while the work was still in progress, for when a sufficiently large number (758) of Baganda children had been examined a significant difference was recorded.

It is to be emphasized that field studies of gross sickling and *falciparum* rates are of little importance unless they extend over several generations, or express in addition the differential mortality from malaria. The justification for the use of parasite counts, which I consider essential in this work, is that they give a measure of the individual's resistance to malaria, and by implication a measure of what mortality may be expected from malaria in sicklers and non-sicklers respectively.—I am, etc.,

Kampala, Uganda. ALAN B. RAPER.

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[6] *East Afr. med. J.*, 1946, **23**, 75.

Deprived Children

SIR,—I think there may be a danger that the data which Dr. Hilda Lewis presents in her book on *Deprived Children* may be so used that it results in misplaced complacency. For instance, your annotation (*Journal*, October 30, p. 1039) in which you write, "Dr. Lewis through her follow-up study is able to show that there may not be full justification for the very pessimistic views of such workers as Bender, Lowrey, Goldfarb, and Bowlby on the effect of separation from the mother in the early years," may lead some of your readers to conclude that those of us who have stressed the grave dangers of separation have been crying "wolf." In fact, Dr. Lewis's data provide yet further evidence that separation (and also other forms of maternal deprivation and rejection) give rise to serious psychiatric disturbance and that separation is especially frequent as an antecedent in the most serious cases. Of the 19 affectionless characters in her series, nine had experienced it (four for between three months and two years, and five for more than two years).

What Dr. Lewis's findings make plain is that, though many children who experience separation suffer damage, many others do not become seriously disturbed. This is of much scientific interest but of no more importance to the practice of preventive health than the recognition that many children who drink tuberculous milk come to no great harm.—I am, etc.,

London, W.1 JOHN BOWLBY.

REFERENCE

[1] *Deprived Children*, 1954. London.

Prevention of Colds

SIR,—The paper by Drs. O. M. Lidwell and R. E. O. Williams (*Journal*, October 23, p. 959) on their trial of hexylresorcinol raises a number of points of interest. Their bacteriological findings appear to confirm the chemical estimation of the aerosol concentration in the air, but these do not tally with the estimated content calculated from the "aerovap" output (Table IV). What can be the explanation for the apparent loss of five-sixths of the bactericide? That there was a constant source of depletion is further borne out by the failure to record a decrease of sick-absence rate, whereas Dickson[1] found a definite decrease in the rate and duration of sick-absence over a four-year period. As a result the aerosol installation was extended to cover "every room of the two largest Departments of State" (411 rooms).

Mackay,[2] whom Drs. Lidwell and Williams do not mention, using 6 to 7 μg./cubic ft. (to convert μg./cubic ft. to μg./cubic m. multiply by 35.3) of air, estimated on the normal "aerovap" output of hexylresorcinol, reduced the bacterial content of artificially infected air from 10^6 organisms/cubic ft. to <10/cubic ft. in 35 minutes when *S. marcescens* was the infecting agent. The experiments were repeated on a number of occasions in a room two-thirds the size of the Newcastle offices. In neither Dickson's nor Mackay's tests can there have been any substantial difference between the actual and calculated aerosol concentrations. It would seem that there must be some hitherto unencountered factor which has influenced the Newcastle experiments, since an aerosol increase of 6 to 7 times normal was necessary before a substantial bactericidal effect was recorded, under which circumstances the concentration was reputed to produce throat irritation although Mackay's 6 to 7 μg./cubic ft. was reported to produce only "a slight feeling of dryness at the back of the throat" detectable by "only the more sensitive observers." In our own experience an output of ten times normal giving a mist very obvious in a Tyndall beam in a dark room has not given rise to any complaints.

There is an unexplained discrepancy in the results recorded in Table V, wherein hexylresorcinol at 1.3 μg./cubic ft. gives higher die-away rates of streptococci than the 4.3 μg. concentration. Thus explanations have to be sought for: (1) the enormous loss of aerosol, which presumably was not due to excessive ventilation; (2) if the complaint of irritation due to over-concentration is upheld the failure of such an aerosol to show direct evidence of bactericidal powers; and (3) the failure of the chemical tests to detect that amount of hexylresorcinol. It is to be hoped that Drs. Lidwell and Williams can advance reasons for their results being at variance with the findings of other workers.—I am, etc.,

Goring-on-Thames. A. HOWARD BAKER.

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Racial Difference in Blood Constituents

SIR,—The interesting paper concerning haemoglobin levels in European and Asiatic populations by Dr. G. R. Wadsworth (*Journal*, October 16, p. 910), and an earlier paper by Wadsworth and Oliveiro[1] on total plasma protein concentration, prompts me to add data collected during the last war on 201 British and 217 Indian soldiers stationed in North India (Dehra Dun). The British soldiers had been in India at least six months: the Indian soldiers were drawn from various parts of the country. All men were on normal duties. The diet for both groups was adequate in calories and total protein, but in the Indian group only about a quarter of the protein was of animal origin. Blood samples were taken in the morning over the period March to October. Haemoglobin, erythrocyte sedimentation rate, and plasma protein concentration were measured on all samples. Details of the methods are given elsewhere.[2]

In the case of Hb (g./100 ml.) the results were as follows: British group, mean = 16.61 ± 0.07, S.D. = ± 1.08; Indian group, mean = 15.67 ± 0.13, S.D. = ± 1.93. The distribution of the British group was normal, but that of the Indian group was skew to the left with a pronounced tail between 12.6 and 8.4 g./100 ml. A t test showed the means to be significantly different ($P<0.1\%$). However, the modes of the distributions were very similar (British 16.61; Indian 16.42 g./100 ml.), and when Hb levels below 13.0 g. were eliminated from the Indian sample the distribution became almost identical. It thus appeared that the difference between groups was due mainly to the presence of mild anaemia in one of them, and the significant difference was apparent only. A racial difference was hence unlikely. This would correspond to Dr. Wadsworth's findings and those of other workers.[3] Variance analysis showed a significant month to month variation for both groups (British, $P<0.1\%$; Indian, $P<1.0\%$) with higher levels in the hotter months of May to July.

The results for the E.S.R. (mm./hour) showed the following: British group, mean = 7.37, S.D. = ± 5.60; Indian group, mean = 7.27, S.D. = ± 7.14. Both distributions were markedly skew to the left and a t test considered not valid. A χ^2 comparison demonstrated that for arbitrary class ranges there was no significant difference in E.S.R. between the groups. Variance analysis showed absence of month to month variation, but other data[3] suggested that a seasonal variation does exist in some individuals, with higher levels in the hot season. The means and S.D. for both groups are appreciably higher than those accepted for temperate climates and correspond in general with those of Khanna and Sachdev[4] for Indian males. In the case of the British soldiers there was no evidence for subclinical infection, and one may

perhaps assume that the higher figures are due to climatic factors. Similar suggestions were put forward a number of years ago by Sundstroem[5] and Frimodt-Möller and Benjamin.[6] In connexion with possible racial differences in E.S.R. the work of Muzyka and Lille[7] on the correlation between E.S.R. and the blood groups is of interest. A number of papers have been published on E.S.R. in non-European groups,[8–15] but European controls have not always been used.

Plasma specific gravity figures were converted into total plasma protein using the formula of Hoch and Marrack.[16] The main results were as follows: British group, mean = 7.07 ± 0.03, S.D. = ± 0.44; Indian group, mean = 7.50 ± 0.03, S.D. = ± 0.46. The means were significantly different ($P<0.1\%$). Variance analysis demonstrated a significant month to month variation for both groups (both gave $P<0.1\%$), and for each month the Indian means were higher than the British. Where *t* tests were done on monthly means, significance was found at $P<0.1\%$. The incidence of subclinical infection (hookworm, etc.) and the intake of vegetable protein was higher in the Indian group, and it is possible that both conditions may increase plasma globulin and total plasma protein concentration. It is hence not valid to assume that the significant difference in plasma protein levels between the groups is in fact of racial origin. The present findings correspond to those of Wills and Bell,[16] but Wadsworth and Oliveiro[1] found no significant difference between various Asiatic and European populations. The literature is covered by the latter workers, but further data have been recently published for Africa[16 17] and the Dutch East Indies.[18] Little correlation was found in the data presented here between Hb, E.S.R., and plasma protein. It may be of interest to add that no significant difference was found in oral temperature between the two groups. This confirms previous work.[19]

Where groups of individuals are being compared, it is not sufficiently realized that any particular type of measurement may be affected by a number of factors such as time (diurnal, menstrual, seasonal, growth and ageing), sex, nutrition, state of activity and immunity, altitude, weather and climate, and so forth. Such variations are not always controlled or even specified. The interpretation of a significant difference (derived from crude data) between the characters of racial groups is hence not to be lightly attempted. The magic of the significance test may sometimes be a pitfall for the unwary.—I am, etc.,

Frimley, Surrey. E. T. RENBOURN.

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Foetal Defects in Early Pregnancy

SIR,—Dr. Ian G. Wickes's valuable paper on "Foetal Defects Following Insulin Coma in Early Pregnancy" (*Journal*, October 30, p. 1029) throws a great deal of light on the causation of these abnormalities and, I think, supports a theory which I put forward 20 years ago. I suggested in a paper called "Cephalic Dysostosis,"[1] which was based on a study of hypertelorism, that the cranial deformities found in oxycephaly, hypertelorism, Crouzon's disease, and acrocephalosyndactyly were the result of some deleterious agent causing temporary cessation of cerebral growth in early intrauterine life. The temporary cessation of cerebral growth allows the bony sutures to unite in some places, and when the brain starts to grow again it forces the skull to expand where the sutures have not united. Thus the skull may be forced upwards and produce oxycephaly, or laterally and produce hypertelorism, and so on. At that time I could not suggest what the deleterious agent might be and thought that it was probably toxic or infectious. However, Dr. Wickes's work now suggests that it may be some temporary interference with the endocrine mechanism, and no doubt where cranial dysostosis occurs spontaneously the endocrines are disordered by mild infections or even dietetic disturbances. It is to be hoped that Dr. Wickes's work will lead to the observation of similar cases and to the pathological examination of foetuses should the patients miscarry.—I am, etc.,

London, W.1. CLIFFORD ALLEN.

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The M'Naghten Rules

SIR,—It seems to me that when discussing the M'Naghten Rules we should realize that there is possibly far more behind the scenes than may at first meet the eye. These rules represent a milestone in the evolution of justice in Great Britain. When they were formulated it is reasonable to suppose that the necessity was obvious, and we must give credit to the legal profession of that time for being just as anxious to do the right thing as they are to-day.

"Times have changed," of course, is a very popular cry nowadays, but perhaps it would be better to say that human nature has not changed, although values have. I am sure that Dr. Eliot Slater (*Journal*, September 25, p. 713) is not seeking to change human nature, only to reorientate its values by a more exact understanding. I think it would be better to view Dr. Slater's points in general and say that it represents a plea for another milestone. As his reasons for this plea he offers us an explanation which is the end-result of considerable observation and thought. The least we can do is give him credit for his line of approach. As these reasons involve observations on human nature and the patterns of reaction to certain environmental influences they naturally have to take into account free will, public opinion, and the like, which everyone likes to talk about but very few probe.

Dr. Slater represents the approach of a psychologist, and, as such, many like to put them all in a pigeon-hole labelled "Up in the clouds," etc. Surely such a sweeping statement is an example of the very things that one is up against. Is not the suggestion that one is absolved from responsibility by accepting such a doctrine an example of the pot calling the kettle black? What is more mechanistic than suggesting that such a revelation will lead to a chain reaction ending up with everyone going berserk? There seems to be a sore need nowadays for a philosophy that treats the individual as an individual and allows him to understand himself a little better. Naturally there are dangers, but, as always, they lie in the interpretation rather than the revelation. Naturally there will be opposition, but that opposition will come from those who feel, "Thank God I am not as other men are," and not from those who say, "There, but for the grace of God, go I."

I am sure that other general practitioners realize this concept of environment and "nature." Although it is extremely difficult to put into words, it is a good basis for prevention not only of illness but of other abnormal situations—I would even go so far as to say war itself.—I am, etc.,

Lancaster. J. A. FARRER.

SIR,—Dr. Eliot Slater (*Journal*, September 25, p. 713) need not be greatly perturbed by the spate of adverse criticisms that have appeared in these columns recently. Few psychiatrists able and prepared to think courageously and boldly will disagree with him on his statement regarding determinism. To us such a statement is axiomatic. It is ineluctable. It transcends our present-day stunted concepts of crime, of punishment, of imputability, of responsibility. On the other hand, to attempt to take away the M'Naghten Rules from our judges and barristers would be to deprive them of a great deal. Outmoded and not a little ludicrous though these Rules are, they yet represent the sum

total of court psychiatry. As Dr. Slater knows only too well, the legal mind is restricted in its thinking by the straitjacket of formal logic and by the pronouncements of luminaries of past generations, and its horizon seldom reaches further than the bare walls of the court—and hardly ever as far as the cells below.

At the same time, man does not lead an inner life only. His actions, however produced, must of necessity impinge upon others, and if they do so to the detriment or to the destruction of his fellow beings legal procedure steps in. But this should not prevent some compromise mechanism being adopted between legal and psychiatric specialists. Of paramount importance to the working of any compromise would be the exclusion of expert psychiatric witnesses from all trials for murder. They should be replaced by a panel of three or four experienced psychiatrists whose duty it would be to examine and report upon the prisoner with regard to his sanity, and their turn of duty could be worked out on some such principle as subserves our jurors' rota. Much emotionalism would thereby be eliminated; the witnesses would no longer be subjected to the histrionics of some fame-seeking barrister (with one eye on the jury and another on the judge); and, above all, the unhappy spectacle of *parti pris* would be banished for all time.—I am, etc.,

Kingswinford, Staffs. WM. A. O'CONNOR.

SIR,—The season for shooting at the M'Naghten Rules having opened, Dr. Eliot Slater has fired a spirited volley (*Journal*, September 25, p. 713). Unfortunately, his interesting paper perpetuates some errors about the history of the rules that he so deplores. The House of Lords in the debate after M'Naghten's case was sitting as a legislative and not a judicial body. The questions put by the House were not addressed to "those of its members who were judges," but to the assembled Queen's Bench Judges. The summing-up by Chief Justice Tindall in 1843 in the case of Daniel M'Naghten was based on established doctrine and introduced no new law.[1] The rules were not "refinements introduced after M'Naghten's time," but were the expression of the well-established, centuries-old, common-law doctrine. If Dr. Eliot Slater doubts the weighty authority of Sir Travers Humphreys on this point, he could confirm it by reference to commentaries written before the nineteenth century.

Discussing the administration of the rules, the author suggests that, after conviction following strict application of the rules, no appeal to a higher court will avail. The Court of Criminal Appeal (not the "Court of Appeal" to which the paper erroneously refers) is, in fact, empowered by the Criminal Appeal Act (1907) to substitute a guilty but insane verdict for a guilty verdict. This, however, is a small point, because it is certainly true that all recent pronouncements from that Court have favoured a strict interpretation of the rules.[2] Dr. Eliot Slater's paper gives point to Lord Buckmaster's remark that "Law and legal procedure have always been a mystery to the uninitiated, a snare to the unwary, and a red rag to the unhappy man possessed of reforming zeal."—I am, etc.,

Penarth. W. R. PROBERT.

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SIR,—I note that in the discussion of the M'Naghten Rules initiated by Dr. Eliot Slater (*Journal*, September 25, p. 713) the old conundrum of free will versus determinism has turned up once more. The conviction of the individual that he exercises what he names free will belongs to his fundamental conviction that he is able to act and is compounded of powers. He claims that he can perform acts which he describes as comparing alternative performances and acting in accordance with a plan that he thereupon chooses. Physics, chemistry, and physiology have no quarrel with this claim; in fact, they teach that at any moment the individual's action will be congruent with the organization of his powers, and that what this organization will be at any moment will depend (*a*) upon how he is being affected sensuously at that moment, and (*b*) upon the peculiar organization of his powers (his character) at the time of this affection. According to this view, what his character will be at any particular time is determined by his cortico-thalamic structure conditioned by his experience. These two reports, subjective and objective, represent two views of the same course of events; they are in parallel and do not conflict.

The notion that determinism as taught by science means that powers that are foreign, and not my own, constantly compel my actions is nonsense. These cerebral atoms and molecules of which science speaks, and in accordance with whose organization it teaches that I act, are its quantitative estimates of the power-items of which I am compounded. They are modifiable in their organization by incoming influences, but they are undeniably my own and the bricks of my character. The social aspect of the individual's choosing is another story. The individuals of a human group, such as a nation, all desire, consciously or subconsciously, what they will name stability, security, survival in balance. Their plans are various. It is written plain in history that each man's stability is tied up with the stability of his group. If he has learnt his history he will consent to restraint by the administration he has had a hand in selecting, and will demand that the restraint exercised should, in general, be adequate. The hope of the psychiatrist appears to be that education and persuasion may prove progressively adequate for group stability. Those who are putting this hope to test surely deserve general support; they are taking on a hard task. At the best substantial success will be slow in coming. It may be asked of them that they should acknowledge that other makeshift restraints cannot yet be abandoned without serious risk of group disintegration.—I am, etc.,

Faringdon, Berks. K. W. MONSARRAT.

SIR,—Mr. Denis Browne's Socratic argument (*Journal*, October 30, p. 1046) is too erratic: he should not let himself continue to be misled by the products of schoolday reasoning. Surely he realizes that free will in one person does not preclude foreknowledge in another. Mr. Browne is free to turn right or left at any cross-road—which proves his free will. Nothing detracts from it if at the same time there is a Being who knows (but does not in any way influence) his choice of right or left. Nor, for that matter, will Mr. Browne's choice influence the omniscience and omnipotence of this Being. As he states himself, it is from his very childhood that he showed his ineptitude in such matters.—I am, etc.,

London, N.10. A. P. CAMILLERI.

Measles Meningoencephalomyelitis

SIR,—The following case of arrested mental development and behaviour disorder following a very mild attack of measles at the age of 2 years 11 months appears to be of interest, in the light of Twining McMath's article on measles meningoencephalomyelitis (*Journal*, October 2, p. 789).

I was asked, as a medical officer employed by a local authority, to make a routine re-examination of a female child aged 6 years 4 months, who had already been ascertained as educationally subnormal to the extent of being unable to profit from school education. The child was big for her age, well developed and with no physical defect. At first sight she looked quite intelligent and had by no means the facies of the backward child. It was quickly apparent, however, that she was hyperactive, restless, and distractable. Her speech was elementary and, in fact, nearly incomprehensible to a stranger, and she perseverated very markedly, to an extent to interfere with the mental testing. Her mother said she was somewhat mischievous and tended to be rough with a younger brother, but that she was friendly, not destructive, and had no temper tantrums. She suffered rather markedly from night terrors and a certain degree of insomnia. Her mental age on the revised Stanford-Binet test was 2 years and her I.Q. 32.

The most striking feature was that the child looked so normal and that her behaviour was so infantile. In taking the history I elicited the following facts. She walked at 15 months and began

to talk at 10 months. Control of the bladder and bowels was attained between 2 and 2½. At the age of 2 years 11 months she had an attack of measles so slight that the doctor only visited her once. But after this illness speech, which had been progressing normally, ceased entirely for a year. She then began to talk again, but has never spoken so well as she did before the illness. Because of the aberrant behaviour which subsequently developed at the age of about 4, her own doctor was asked to see her. He then noted that development had been normal up to the age of 3, but that now she was subject to temper tantrums, very restless in bed and slept badly, and had spasms of diurnal incontinence; also that her only answer to questions was "No" (according to the mother, at that age she was only just beginning to talk again).

The picture of a healthy well-grown child showing no paralyses or other physical symptoms, but with restless, mischievous, and infantile behaviour coupled with sleep disturbance, appears strongly suggestive of the sequelae of an encephalitis.—I am, etc.,

Nottingham. ALISON M. HAMILTON.

Paper-folder's Fingers

SIR,—An occupational deformity somewhat similar to the window-cleaner's finger described by Mr. P. J. Moir (*Journal*, September 25, p. 757) was seen recently in a patient admitted to St. Bartholomew's Hospital under the care of Dr. Geoffrey Bourne. This man, aged 67, had an ulnar

FIG. 1

FIG. 2

deviation of the distal two phalanges of the right index finger together with two small, firm, painless subcutaneous nodules, one on the radial side of the same finger and the other on the dorsal surface of the second left finger (Fig. 1). The patient had been a clerk for 50 years and attributed these changes to his work, which involved folding large numbers of documents. This explanation did not seem to account for the site of the nodule on the left hand until he demonstrated his peculiar method of smoothing down the creases (Fig. 2).—I am, etc.,

London, E.C.1. M. W. PARTINGTON.

Stricture and the Indwelling Catheter

SIR,—Mr. Ralph Shackman and Mr. David Messent remind us (*Journal*, October 30, p. 1009) that if an indwelling catheter is retained for any length of time a urethritis almost always results. After prostatectomy this is likely to cause stricture in as many as 10% of cases. Surely this is a new development. The explanation given, that in the old-style open operation suprapubic drainage spared the urethra, will not hold water, because an indwelling catheter was nearly always used after this operation while the cystotomy wound was healing. There is another possible explanation which is worth consideration. It may be that chemotherapy and antibiotics are responsible. It is true that a single injection of penicillin will cure gonorrhoea without any risk of subsequent stricture. But in this case the infection is acute, whereas in the other it is chronic—i.e., chronic as long as the catheter remains indwelling. I have seen a patient come back a few weeks after prostatectomy with a stricture which involved the whole length of his anterior urethra: the catheter had been removed on the third day and the urine was clear from the time the haemorrhage stopped. He had been given streptomycin, and it may be that he escaped a urethritis at the expense of a fibrosis. Another patient's anterior urethra was reduced to the calibre of a knitting-needle after an abdomino-perineal operation, following which the bladder was drained and penicillin given.

I submit that the presence of an indwelling catheter may be a contraindication to prophylactic chemo- and antibiotic therapy, though I know of no method of preventing house-surgeons from using it.—I am, etc.,

London, W.1. STEPHEN POWER.

A Fatal Attack of Cyclic Vomiting

SIR,—Dr. R. J. K. Brown's excellent description (*Journal*, October 30, p. 1033) serves to draw attention to a problem which is still baffling. He says that there seem to be both constitutional and exogenous factors at work. I am firmly convinced that in the majority of cases the constitutional factor is idiopathic epilepsy. I have endeavoured to prove this in a paper which is awaiting publication. Once this is admitted the explanation of the attacks becomes simple, and the biochemical changes can be seen as secondary effects of repeated vomiting.

In the case recorded by Dr. Brown there are three points which suggest that there may have been an epileptic basis for the attacks. These are: first, that treatment with phenobarbitone seemed to lessen their frequency and severity; secondly, that in the final episode the child had some twitching movements of her limbs and face; and, thirdly, that the plantar responses were extensor. It would be interesting to know if there was any family history of epilepsy, if electroencephalographic studies were made on this child, and if at necropsy any changes were found in the brain which would support a diagnosis of epilepsy.—I am, etc.,

Bath. HUGH R. E. WALLIS.

Selection of Medical Students

SIR.—While I was taking the Birmingham medical course, its fourth year was freed from professional examinations "to create opportunities for students to enjoy some of the wider cultural aspects of university life."[1] The University authorities kindly let me investigate the effects of this innovation. If a houseman may rush in where professors fear to tread, I should like to quote from my findings in response to Lieutenant W. M. Wilson's appeal (*Journal*, September 25, p. 755) for views on medical education's "cultural poverty."

The extent to which any group of students participates in non-academic activities seems roughly proportional to the percentage elected to offices in student organizations open to all. Medical students found to have held such offices in the last eight sessions were therefore classified into generations, and the effect of freeing the fourth year from examinations assessed by comparison between the last two generations of students to precede this change and the first two to experience it—that is, those due to

graduate in 1950, 1951, 1952, and 1953, respectively. Only 15% of the first of these generations and 12% of the second, but 20% of the third and 22% of the fourth, held offices for part of their university careers. The first generation produced more office-bearers than the second because more of its students (10 as compared with three) held offices in their course's third year—having presumably given more time to non-academic activities during their second year when (unlike all their successors) they had no professional examination. Similarly, the higher figures for the third and fourth generations reflect a fourfold increase in the number of students holding offices for the first time when in their fourth year. While the introduction of second-year examinations seems to have reduced students' cultural activities during the first part of the course, freedom from examination during the fourth year (as enjoyed by the third and fourth generations) apparently encourages these activities then.

Altogether, 74 students from the four generations mentioned held offices, and their examination results before, during, and after their terms of office show respectively 85%, 58%, and 80% of passes at the first attempt. As the pass rate for finals (which few present, and no future, office-bearers take) is always lower than for earlier examinations, the figures to compare are the ratios between the above percentages and those for corresponding groups of students with average pass rates. These ratios are 1.04:1 for future, 0.77:1 for present, and 1.15:1 for past office-bearers. Thus, those who held offices in student organizations had practically average examination results before doing so: and although their results were markedly subnormal in years of office-bearing, they achieved an academic standard rather *above* normal in subsequent years.

The Birmingham course's year without examinations therefore enables students to enjoy non-academic activities with profit rather than detriment to their academic records, since they have the next year to make up any academic lee-way before the next examination. And from our evidence that students *are* using the examination-free year to broaden their minds through such activities, it seems that this is at least helping to remedy the medical course's cultural poverty.—I am, etc.,

Walsall. IAN M. LECK.

REFERENCE

1 University of Birmingham Medical Graduates' Newsletter, 1950.

Alcoholism and Attempted Suicide

SIR,—Dr. M. M. Glatt (*Journal*, October 23, p. 991) believes that "what may be more disturbing [than other indications that abuse of alcohol is becoming more common] is that, according to an Economic Research Council Report, the rise of convictions for drunkenness between 1950 and 1953 affected chiefly the young—convictions for drunkenness of youths under 21 rose by 102%, compared with the increase of only 19% among older men; convictions for drunkenness of girls under 21 rose by 80%." The report in question throws a melancholy light not on drunkenness trends but rather on some methods whereby these trends are assessed for the "enlightenment" of the public. On analysing the "survey" on which the council based its report, one finds that if two fishing ports and a docks centre had, like nine-tenths of the country, not been covered, the council would have had to report an improvement in youthful sobriety. The total reported increase in drunkenness convictions among under 21's was more than accounted for by the increase in these three centres. On the evidence of the survey, the problem of increased youthful insobriety is not a national one but a local one, presumably created by the young seaman cutting loose ashore.

The report that "convictions for drunkenness of girls under 21 rose by 80%" is based on eleven more drunkenness cases in a population of 4,000,000 over four years. The rate of increase was one in about 1,500,000 people a year. Yet it was described by the council as a "sharp rise in drunkenness among girls under 21" and supposed by them to be reflected in an increase of illegitimate births. That the survey dealt with centres where juvenile insobriety was exceptionally high has since been shown by the official statistics, *Offences of Drunkenness, 1953*. In the centres covered by the survey, cases of insobriety among under 21's number 1.25 per 10,000 of resident population. In England and Wales as a whole, such cases numbered 0.70 per 10,000 of total population. Your readers, therefore, will not be surprised to learn that the council's report was produced at the request of the United Kingdom Alliance, which was founded for the suppression of the liquor trade and whose public relations officer is also the council's secretary.

Insobriety is deplorable, youthful insobriety particularly so, but no useful purpose is served by drawing conclusions as exaggerated and unwarranted as those drawn by the council from its part-survey.—I am, etc.,

L. R. N. PERCEY,
General Secretary,
Licensed Victuallers' Defence League.

London, E.C.4.

Treatment of Gout with H.P.C.

SIR,—I have noted Dr. R. P. Warin's letter (*Journal*, October 23, p. 990), in which he describes his unfortunate experience of the use of H.P.C. in the treatment of scleroderma. Although he does not mention it specifically, I imagine that he took the precaution of administering sodium bicarbonate simultaneously as advised by the American workers. This was done in my own series, which included several rheumatoid arthritics and one case of scleroderma not described in my article (*Journal*, October 2, p. 782), since the results were inconclusive. Presumably the alkali diminishes any irritant effect of the drug on a particularly sensitive intestinal mucosa, and tends to prevent lower nephron nephrosis.

However, there is no doubt that H.P.C.—like other "anti-rheumatics," including gold, butazolidin, and cortisone—has to be used with caution, and any attempt to distribute it as a potent aspirin is to be deprecated: otherwise a powerful agent for the treatment of gout may be discredited before a full assessment has been made.—I am, etc.,

Newcastle-upon-Tyne, 4. D. N. ROSS.

New Blood-transfusion Sets

SIR,—I am sure that countless residents who are responsible for setting up transfusions, and nurses who are responsible for maintaining them, will heartily agree with all that Dr. Anthony R. Wisdom and Dr. Erica J. Jones (*Journal*, October 23, p. 994) have written about the new transfusion giving sets. By the time that their letter appeared in print these sets were already being withdrawn from some hospitals and replaced by the old pattern.

Not many weeks ago prior notice was received of an allegedly "improved" transfusion set which, it was promised, would overcome many of the difficulties experienced in the past. Those who had used the old-type sets during and after the last war were somewhat surprised to hear that this apparatus was considered unsatisfactory, and the new apparatus was awaited with mixed feelings. When it arrived it took but brief experience to show its serious inadequacies; in fact, apart from the provision of a "pilot" bottle, there were no improvements at all. Vigorous protests were made by some hospitals in the London area, but the transfusion authorities seemed slow to hear our objections. At least one large hospital, unable to get satisfaction from its usual depot, made special arrangements for a supply of the old sets from another depot. After several weeks of chaos and frustration we are now being issued with the old sets; the "improved" model is being withdrawn, and officialdom has at last admitted that the new apparatus is not satisfactory.

It would be interesting to hear, Sir, who is responsible for this latest manifestation of bureaucracy in medicine. In the past we have been accustomed to transfusion services of a very high standard, and it is dispiriting to find that a matter of such importance has been handled with such ineptitude. One may well ask how much public money has been wasted in devising the new apparatus, issuing it, withdrawing it, and then reissuing the old apparatus. Could those who have the responsibility for giving transfusions in hospital be assured that this most regrettable state of affairs will never occur again?—I am, etc.,

Radlett, Herts. R. S. MURLEY.

Respiratory Failure in Acute Chest Infections

SIR,—Dr. E. Keith Westlake is to be complimented upon his paper on respiratory failure in chest infections (*Journal*, October 30, p. 1012). The danger of carbon dioxide narcosis when oxygen is administered by tent to such patients is well known, and he does well to mention that it may occur even when a B.L.B. mask is used. This is often considered quite safe, but it is only so if the rate of flow is kept low, as much as 7 litres per minute not infrequently resulting in coma. Recovery is usual if the mask is removed before irreversible respiratory failure has occurred, and can be expedited by giving nikethamide intravenously, 10 ml. or more being required.

I should also like strongly to support the warning he gives against the use in patients with little respiratory reserve of morphine or other opiate, the effect of which, as I have emphasized elsewhere[1] may be lethal. The rapid intravenous administration of 10 ml. of nikethamide is valuable in rescuing patients after apnoea and coma have thus been precipitated, and this drug is effective when barbiturate is responsible, unlike n-allyl *nor*morphine. The initial intravenous dose should be followed by large doses intramuscularly, of the order of 5 ml. two-hourly for 12–24 hours. I have recently seen a patient with a large pleural effusion plunged into deep coma by 3 gr. (0.2 g.) of pentobarbitone given before paracentesis, and her recovery after this treatment.—I am, etc.,

Manchester, 3. NEVILLE ROUSSAK.

REFERENCE

[1] *Lancet*, 1951, 1, 1156.

International Anatomical Nomenclature

SIR,—I am glad that Dr. H. Williamson (*Journal*, October 30, p. 1051) has raised again the matter of the proposed revisal of anatomical nomenclature. I think this is the third change that has been made in my professional lifetime. A purely descriptive terminology such as *iter e tertio ad quartum ventriculum* is, of course, easy to learn, though cumbersome. A purely ridiculous name such as "epistropheus" may stay in the mind, but the fact is that almost beyond everything we need a stable nomenclature, and I begin to wonder whether it might not be useful for an international committee of surgeons, concerned as they are with applied anatomy, to make their own final decision on the matter. The anatomical scientist, of course, is not concerned with the practical application of anatomy, and, indeed, may even indignantly deny that he is the handmaid of surgery. Perhaps, if he is logical, he will abandon the use of Latin and use Esperanto. My own impression is that anatomy for the surgeon has suffered a severe handicap through repeated change. The emotional reaction brought about by the first world war against the Basel nomenclature, with which I understand German anatomists had so much to do, was most unfortunate.—I am, etc.,

Birmingham, 15. H. DONOVAN.

Danger of Penicillin Injection

SIR,—The rarity and seriousness of the acute anaphylactic reaction to penicillin prompts me to report the second example seen in my practice. My first case was reported in the correspondence column of the *Journal* (October 3, 1953, p. 777).

A robust man, aged 38, consulted me on account of a large carbuncle on his back with considerable surrounding cellulitis. There was no personal or family history of allergy. Twenty months before he had sustained injury in a car accident, when he was given prophylactic injections of penicillin for seven days. A few days later he developed a rash which cleared rapidly with treatment. I gave him 2 g. streptomycin daily for two days, but as there was little improvement in the cellulitis I switched to 900,000 units "distaquaine" daily for the next four days. By this time the cellulitis had resolved and the core was separating. For the next three days he received no systemic treatment, but then the edge of the crater looked unhealthy, so I repeated his former dose of penicillin for two days. Four hours after his second daily injection he felt faint for a minute or two. On the next day I gave him a further 900,000 units "distaquaine" into his left buttock. Almost immediately he felt very ill and sat with his fists clenched repeating, "I must fight this thing." He was able to answer direct questions throughout. His pulse rate was 160/min. with multiple extrasystoles. His colour remained normal. There was no cyanosis or overfilling of neck veins. After about one minute he complained of throbbing in his back, indicating the tip of his fourth lumbar spine as the precise spot, and of paralysis from that level downwards. He could not feel the chair beneath him but could raise both feet just clear of the ground with difficulty. His arms felt numb and heavy. His pulse rate was still 160/min. with multiple extrasystoles. About three minutes from the onset his legs felt a bit better and the throbbing in his back had ceased, but he now complained of crippling substernal pain and pounding of the heart. Pulse now 140/min. with multiple extrasystoles. The pain eased after about one minute but the pounding remained. Pulse now 120/min. with occasional extrasystoles. Six minutes from the onset he felt much better. The palpitation had ceased and sensation had returned to his body and legs. He now had a feeling of coldness from the waist downwards and of tingling in the arms and fingers. These sensations passed quickly, and ten minutes later he said he felt normal and cheerful. His pulse was now 80/min. and regular. At no time was there any cyanosis, respiratory embarrassment, or abdominal pain.

Asked to record his experience in writing as briefly as possible he wrote as follows: "On rising from the chair I felt sick and faint. I tried to attract the doctor's attention but could not speak. I sat down, felt I had 'passed out' yet knew I hadn't; then a feeling of unreality, then quite clearly the noises of traffic, of people singing, and of running water. Objects in the room became double and moved up and down slowly and rhythmically. I could see my body rising into the air yet knew I was sitting on the chair. I was sure I had already passed into the next world. Then came the feeling of paralysis in my legs and body and the throbbing in the spine. My arms felt too heavy to move. Then the terrifying pain in my chest and the palpitation—as though my heart was going to burst or jump out of my body. Never in my life have I been so afraid. When all these things had passed and I was feeling more myself I felt a coldness coming into my legs and body and a tingling in my arms and fingers. This passed quickly and I began to feel normal again."

—I am, etc.,

Leeds, 7. G. W. LEWIS.

Treatment of Leg Ulcers

SIR,—Your annotation on leg ulcers (*Journal*, October 30, p. 1040) reviews a very important and old problem. The difficulty with leg ulcers is not so much getting them healed—this can be done in almost all cases by bed rest and medical care—the difficulty is to keep them healed when the patient is up and about. The aetiology of the leg ulcer is hydra-headed and beyond the scope of this note, but there is a type of ulcer we can recognize and treat. This is the post- and infra-malleolar ulcer. This ulcer is associated with abnormal veins—that is, veins with incompetent valves. Incompetent valves present both in the superficial veins and in the communicating veins that join the superficial and deep veins. These valves are either congenitally defective or are damaged by the injudicious use of sclerosing injections. Malnutrition of the skin is due to the retrograde stream of blood via the superficial incompetent veins, and leak from the deep veins via the "blow outs" of the communicating veins. The "blow outs" below the level of the calf muscles are of especial importance inasmuch as when the calf muscles contract they supply at pressure venous blood to the malleolar area. Here ulcers will persist if the superficial veins only are treated.

To treat these ulcers we must have a fourfold approach. We must ligate and divide all veins at the saphenous opening, strip the saphenous vein, destroy all the "blow outs" in the calf, and also do away with the lower "blow outs," often into the floor of the ulcer itself. This can be done by searching for the three or four "blow outs" and destroying them in the floor of the ulcer, as advocated by F. B. Cockett and Eldon Jones.[1] However, as this is difficult, and at times impossible to do, I have devised another method of severing these communicating veins. Through a series

of two or three stab incisions, using a 15 Bard Parker blade, I have completely undercut the whole ulcer-bearing area, an area of about 4 sq. in. (25.8 sq. cm.), keeping as deep as possible. I usually operate as soon as the ulcer is clean. I use dressings of eusol, two-thirds, and liquid paraffin, one-third, applied in a "stoss"—that is, several dressings repeated quickly over four hours each day. As soon as there is little pus on the overnight dressing, and there is a blue edge of epithelization to the ulcer, showing that there are no virulent bacteria present, I consider it safe to operate. If healing does not start, I then resort to the specific antibiotics determined by culture. Operation as outlined above is carried out, and, if large, the ulcer is grafted by a split skin graft. The above method has been carried out for the past year or more with satisfactory results, but follow up is as yet, of necessity, short but satisfactory.—I am, etc.,

London, E.1. CHARLES HEANLEY.

REFERENCE

1 *Lancet*, 1953, **1**, 17.

SIR,—Your annotation (*Journal*, October 30, p. 1040) omits to mention the most important advance of all in the treatment of leg ulcers—namely, acceptance of the fact that these ulcers must be pigeon-holed into their appropriate groups if treatment and follow-up results are to have any real meaning.

You state that Spier and Clifften[1] healed 9 out of 16 ulcers with hyaluronidase, plasminogen, streptokinase, and terramycin. If these were varicose or post-thrombotic ulcers, they are wasting their time, for the standard ambulatory antigravitational methods heal 16 out of 16. If, on the other hand, they were *ischaemic* ulcers, I, in common with all others immured in the treatment of these conditions, rush to follow their example.—I am, etc.,

London, W.1. STANLEY RIVLIN.

REFERENCE

1 *Surg. Gynec. Obstet.*, 1954, **98**, 667.

More Coronary Occlusions

SIR,—It seems to me that coronary incidents are more numerous and more fatal this year than in other years. I have had this impression confirmed by others. I wonder whether the use of the new long-acting nitrates has any bearing on this. Their very efficiency in preventing anginal pain may rob the patient of a necessary warning signal to go slower.—I am, etc.,

London, N.W.2. O. S. KOHNSTAMM.

POINTS FROM LETTERS

Smoking and Lung Cancer

Dr. SYDNEY PERN (Ballarat, Victoria) writes: At the present time there is much talk about the prevalence of lung cancer and its relationship to smoking. A very large proportion of the community is suffering from sinus infection, which is commonly called catarrh, and very little notice is taken of it. *X*-ray of the lungs of these people, in a large majority, shows increased hilus thickening, which is the result of lymphatic drainage from the infected sinuses being carried to the mediastinal glands and spreading out along the bronchi. In view of the fact that in so many cases of cancer there is a history of chronic infection, I would like to suggest that the predisposing infection, plus the tobacco irritant, may have a great deal to do with the prevalence of lung cancer, and of the two I should place the chronic infection first.

Hot Water and Midwifery

Dr. W. B. MUMFORD (London, S.E.16) writes: I wonder if Dr. I. S. L. Loudon (*Journal*, October 23, p. 994) has heard the somewhat apocryphal story of the delivery in a crowded tenement at the conclusion of which the midwife bade the student retire into the kitchen to bath the baby. After a pause there was a splash and a cry for help: "Nurse, come quickly, I have dropped the baby into the bucket and the water is far too hot to pull it out."

Obituary

F. W. GOYDER, M.B., F.R.C.S.

The death occurred at Bradford on October 18 of Mr. F. W. Goyder, one of the pioneers of orthopaedic surgery in the West Riding of Yorkshire. He was 77 years of age.

Francis Willoughby Goyder was born at Bradford in 1877, the eldest son of Dr. David Goyder, who was at one time physician, or medical officer as the position was styled in those days, to the Bradford Royal Infirmary. Francis Goyder was educated at Bradford Grammar School and was an open exhibitioner at St. John's College, Cambridge, where he took the natural sciences tripos in 1899. He went on to St. Mary's Hospital as a university scholar, and qualified M.R.C.S., L.R.C.P. in 1903, taking the degree of B.Chir. in the same year and the M.B. in 1905. After qualification he held several resident appointments before returning to Bradford, where he was appointed assistant surgeon to the Royal Infirmary in 1906. In the following year he obtained the F.R.C.S.

From the outset of his career Goyder was always interested in orthopaedic surgery, though he did not at first specialize in that branch. In 1912 he was awarded the Jacksonian Prize of the Royal College of Surgeons of England for his essay on cleft palate, and in 1915 he edited the surgical section of the *Medical Annual*. After returning from service in the R.A.M.C. in the first world war he was appointed honorary surgeon to Bradford Royal Infirmary in 1918, and continued in that capacity until his retirement under the age limit in 1938. But retirement did not put an end to his active life. He became a group adviser and orthopaedic specialist in the Emergency Medical Service, an appointment which entailed many hours of hard work and much travelling over the whole of the West Riding until his final retirement in 1950. A member of the British Medical Association for nearly forty years, he acted as one of the honorary secretaries of the Section of Diseases of Children at the London Annual Meeting of the Association in 1910; and at the Annual Meeting held at Bradford in 1924 he served as a vice-president of the Section of Orthopaedics.

Goyder was a careful and beautiful operator, and spared no efforts to obtain the best possible results in the interests of the patient, regardless of time. He was of a shy and retiring nature and one of the most unselfish and altruistic of men, and but for these qualities would have been much more widely known. He possessed a caustic wit and did not suffer fools gladly, but he was always kind and his remarks never gave offence to anybody. His memory was extraordinary, and up to the end of his years he had an intimate knowledge of the finer details of human anatomy. He is survived by a widow and one son, who was also educated at Cambridge and St. Mary's Hospital and who qualified in 1951.—W. A.

AUGUSTE ROLLIER, M.D.

The village of Leysin, in the Canton Valais of Switzerland, will always be remembered for the work done there by Professor A. Rollier, who died on October 30 at the age of 80. When he went to Leysin in 1903 it was a hamlet with one boarding-house: to-day it is a township of sanatoria and clinics for the treatment of tuberculosis.

Auguste Rollier was born on October 1, 1874, at St. Aubin, above the Lake of Biel in Switzerland, his father being the vicar of the parish there. Educated at Neuchâtel and at Zurich and Berne universities, he graduated in medicine in 1898 and then spent four years studying under Professor Kocher, of Berne. It was at this time that his fiancée became seriously ill with tuberculosis, and instead of settling as a surgeon in Berne Rollier went into a rural general practice at Leysin, hoping that the mountain air would prolong her life. In fact, it did more than that, for Madame Rollier fully regained her health and became the mother of a flourishing family.

Rollier was confirmed in his belief about the curative power of fresh air and sunshine by his observations on the healing of wounds sustained by the patients in his practice. Infection was rarely seen, and he used to quote a saying of the mountain people: "Where there is sun and pure air, you need no doctor." In his early trials of heliotherapy he went very carefully, exposing a small area of the patient's healthy skin for a few minutes to fresh air and then to sunshine. It was not until the skin was healthily brown that he exposed a suppurating wound to sunshine, and then only very gradually. In this way he avoided the dangerous reactions that the critics of his methods had justification to fear. Rollier believed also in the importance of improving the patient's morale, especially in tuberculosis, and he was one of the first to develop the practice of giving tuberculous patients useful work to do. While some of his ideas, which he expressed in a number of books—the best known of which, *Die Heliotherapie der Tuberkulose*, was first published in 1913—did not gain universal acceptance, there is no doubt that many hundreds of patients who came to Leysin—particularly children with tuberculous adenitis and tuberculosis of bones and joints—made remarkable recoveries under his care.

Rollier's work earned him international recognition, and for many years he was head of the faculty of medicine at Lausanne. A member of numerous learned academies, he received honorary degrees from the universities of Lausanne and Berne.

Mr. M. C. WILKINSON writes: The name of Professor A. Rollier is inevitably associated with the treatment of skeletal tuberculosis by heliotherapy. This, indeed, was his main interest, but there was more to it than that, and to appreciate his life work it is necessary to go back to the year 1903, when he opened his first clinic at Leysin. At that time skeletal tuberculosis was a severe and frequent disease, ravaging children and adults up and down the cities of Europe and Great Britain, and facilities for its treatment were very inadequate. The mortality was high, and many patients passed into a chronic, hopeless, and miserable condition. Many hundreds of these patients arrived at Leysin, where they found three things: first, a doctor who regarded each patient individually as a sick mind as well as a sick body, and who was ready to impart to them his own unflagging will to recovery; secondly, the *pansement solaire*, which was a combination of heliotherapy and very modified orthopaedic splinting; and, thirdly, the "work cure," which, translated into modern language, meant rehabilitation, introduced from the start of treatment and increased until the patient was not only cured but able to earn his living again. Perhaps the value of heliotherapy was overstressed to the disadvantage of other therapeutic measures, but as practised by Rollier it produced very good results. Its chief essentials were the continuous supply of strong sunlight available at Leysin and its application by most scrupulously graded dosage according to the requirements and response of each patient. Rollier admitted the limitations of this form of treatment in other climates, but thought that much could be done even by modifications of his methods. The English pioneers placed more reliance on the open air than on sunlight, but they had this in common with Rollier, that they saw their patients' general condition restored, weight regained, and muscles, wasted by reflex spasm, recovering their normal healthy tone and contour. Professor Rollier has died, but in these days of "smog" and larger and larger cities the ideas he did so much to foster should not be allowed to die with him.

P. S. HUNTER, C.B.E., M.B., D.P.H.

Dr. P. S. Hunter, for many years health officer to the Singapore municipality, died at Singapore on March 27 at the age of 70.

Peter Sinclair Hunter was born at Newmills, Banffshire, on December 12, 1883, the son of a schoolmaster, and was educated at Mackie Academy, Stonehaven, and at Aberdeen University, where he graduated M.B., Ch.B. in 1908. He obtained the D.P.H. in 1911. After graduation he held an appointment at a mental hospital in England for a year before leaving for Malaya, where he remained for the greater part of his life. Hunter first entered the service of the municipality of Singapore in 1913 as a bacteriologist, to which task was soon added the duties of antimalarial officer, and held the post until 1923, when he was appointed health officer. Towards the end of the first world war he served in France as a captain in the R.A.M.C. In 1939, on his retirement from the city health office, he went into estate practice in Johore. He was thus engaged when the Japanese invaded Malaya, but he managed to escape to South Africa, where he was appointed assistant medical officer of health and bacteriologist at Kimberley. After the end of hostilities the Malayan Planning Committee invited him to return to Singapore as director of medical services under the British Military Administration, but he declined the offer and elected instead to return as a civilian. Back again in Malaya, he continued in unobtrusive and unostentatious ways his many charitable activities, kept open house, and many members of his old staff were his closest friends. On principle he never lent money, but he gave it freely to those in need, and the mixed congregation at his funeral was a testimony to his kindness to people in all walks of life.

He was the first to put into practice the belief that local men properly trained could hold any job suitable to their training, and the health department at Singapore was the first department to give the local man his chance, and the local graduate owes much to Hunter's help in his fight for recognition.

In his youth Hunter was a keen wrestler, and in Malaya he played a good game of tennis and football. Gardening and horse racing were his hobbies, and in fact Hunter's main interest outside his work was the Singapore Turf Club and racing in Malaya. He became a member of the committee of the Turf Club in the early thirties, when the club had acquired land at Bukit Timah and a new racecourse had to be laid out. His suggestions on the antimalarial measures to be adopted were invaluable, and his advice on housing the staff led to the attractive lay-out seen to-day. In fact, the new model village housing several hundred employees is one of the most attractive schemes ever seen in Malaya. Hunter served on the committee more or less continuously until he left for England for medical treatment in 1952, at which time he was its worthy chairman. The wish of many who have seen what he achieved at Bukit Timah is that the new village should bear the name of "Kampong Hunter." Hunter was regularly recommended for

an honour during his later years of service with the city council, and at the Coronation of King George VI in 1937 he was appointed C.B.E. Hunter's physical decline set in on the death of his wife during the riots which occurred in December, 1950. He became a lonely man whose tedium was relieved most when he was helping someone he deemed less fortunate than himself. Though his last illness was drawn out and at times painful, he faced it with a determination and courage which was an example to all.—W. A. N.

Mr. R. J. FARRER, president of the Singapore Municipal Commissioners during much of Dr. Hunter's tenure of office, writes: On the outbreak of the first world war Hunter assumed the additional duties of medical officer in the Singapore Volunteer Corps, and in this capacity in 1917 he cleaned up Blakang Mati, then a hotbed of malaria, at the price of two years of maintaining and oiling the existing inefficient drains. About the same time he, as executive officer to the joint government and municipality antimalarial committee, eradicated the disease at Mount Faber. In 1919 the municipality separated from the joint committee, and thereafter Hunter was solely responsible for all the municipal area. His energy, ability, and accessibility had made him the obvious choice for health officer whenever a vacancy should occur, and this came about in 1923, but thereafter he still kept his hand in on the antimalarial work. When it was decided to obtain the new water supply from Gunong Pulai, it was also decided that, while the erection of buildings for housing must go on during daylight hours, no one should be allowed to spend an hour of darkness on Gunong Pulai until Hunter had done his best to safeguard the occupants of quarters there against malaria. That this was wise is shown by the Sultan's statement when opening the pipeline, "When I was a boy there was where we stand to-day a coffee estate known to us boys as the 'cemetery estate,' for all who came to live here died of malaria." I remember Hunter saying to me, when told of his mission, "I am going to prove that sanitation pays." He spent nearly four months crawling about the hill to deal with innumerable trickles and streams, and he installed a water-carriage system for sewage. The capital expenditure was about $55,000, and he saved the town perhaps as much as $5 million, to say nothing of the number of lives and constitutions preserved, for from start to finish the health of the labour force was better than that of the residents of Singapore town. After this triumph he was of course asked to try his hand on the next danger spot, the surroundings of the Pontian Kechil Dam, and there he repeated his success with *Anopheles umbrosus* as a foe additional to *maculatus*. Back in Singapore he year by year dealt with malarious ravines until the last one had been conquered. During the 'thirties he became antimalarial consultant to the Admiralty in connexion with the construction of the naval base, and in 1937 he took a leading part in the League of Nations' antimalarial courses. He then turned his attention to mosquitoes in general and cleaned up the racecourse area, where the ground was very waterlogged.

So far I have mentioned nothing but malaria or mosquitoes, with the object of trying to give a complete picture of that branch of Hunter's activities. To turn to other matters, infant welfare was his child, and almost the nearest to his heart. We also owe to him, and to no one else, the clean, well-lighted eating-houses of to-day—hawkers' shelters likewise. Most of the credit for the abolition of fly-breeding in refuse dumps is his. The erection of the new pig abattoirs at Jalan Besar and the abolition of night slaughtering (a concomitant of which was the increase in the apparent weight of pork by injecting water into the veins of the carcass), and chilling meat for ten hours before issue to the public, give further instances of the improvements he instituted. If one studies the death rates year by year during his term of office one will find a continuous downward trend.

To sum up, it may fairly be said of him, *Nihil quod tetigit non ornavit*, or, as of Wren, *Si monumentum requiris, circumspice*.

IVAN C. C. TCHAPEROFF, M.D., D.M.R.E.

Dr. I. C. C. Tchaperoff died suddenly at his home at Victoria, British Columbia, on August 22 at the age of 51.

Born in London on June 25, 1903, Ivan Claude Christo Tchaperoff was educated at St. Dunstan's College, Catford, and at Caius College, Cambridge, receiving his clinical training at St. Thomas's Hospital. After qualifying in 1928 he was appointed clinical assistant in pathology and cardiology at St. Thomas's Hospital, and later moved to Carlisle, where he was successively house-physician and senior house-surgeon at the Cumberland Infirmary. In 1929 he obtained the degree of B.Chir., and in the following year he entered the field of radiology, serving as radium registrar at St. Thomas's until 1934, then as assistant radiologist until 1939. He took the D.M.R.E. in 1931 and the M.D. in 1933. In 1937 he was elected honorary consultant radiologist at Beckenham Hospital, and in the following year radiologist to the London Royal Eye Hospital, later being made a life governor for his services to the latter hospital. He enrolled as a member of the Radiologists Group of the British Medical Association soon after the Group was formed in 1936.

Tchaperoff migrated to Canada in 1939, taking the L.M.C.C. in 1940 and receiving the certificate in the specialty of diagnostic and therapeutic radiology of the Royal College of Physicians and Surgeons in Canada. During the last war he held the rank of major in the R.C.A.M.C., serving at various military hospitals at Toronto, Ottawa, Vancouver, and Victoria. After the war he decided to return to the west coast, where, after a year at Vancouver, he finally settled at Victoria and became director of the department of radiology at St. Joseph's Hospital, a position which he retained until his death. He is survived by his widowed mother and his only son, Christo, aged 8 years.

Tchaperoff was a brilliant and efficient teacher. An enthusiast for visual education, he employed a wide variety of illustrative material in his lectures. He held teaching posts at St. Thomas's, and from 1937 to 1939 lectured on radiological anatomy at the Medical School. It was at this time that he published *A Manual of Radiological Diagnosis*, and he was part author with the late Professor A. B. Appleton and Professor W. J. Hamilton of *Surface and Radiological Anatomy*, published in 1938. At St. Joseph's Hospital, Victoria, he was instrumental in revising and raising the standards of the school of radiography so that it ranked as the best in the Dominion of Canada. During the past few years he had the great satisfaction of hearing from former colleagues of the wonderful reputation that some of his students had made at leading institutions in England.

Endowed with a keen, inquisitive mind, Tchaperoff was always engaged in some investigation, and improvements to instruments occupied his attention from his early days at St. Thomas's to the end. Most of his evenings were spent in his well-equipped workshop, from which he turned out many useful gadgets for his laboratory work and lecture demonstrations. Ever striving for greater perfection in diagnosis, he was the first in Canada to have installed at the hospital an image amplifier for diagnostic work. Early papers published while at St. Thomas's showed his interest in neoplasms, an interest which continued throughout his later years. During the last war he worked under the National

Research Council of Canada on the effect of gamma radiations on the sulphonamides and *p*-aminobenzoic acid, out of which arose his later investigations on the possibility of raising the patient's tolerance to high doses of Roentgen rays through simultaneous administration of P.A.B.A. Disappointed by the scepticism and lack of support from his clinical contemporaries, he turned to the experimental side of the problem. During the past two years, under a grant from the National Defence Research Board, he had been investigating the possibilities of P.A.B.A. and similar substances as a protective medium against atomic radiations. Recent findings in radiation biology and chemistry may yet vindicate the stand he took on this subject during the past few years. He did not publish a great deal, and many of his later clinical and experimental data are unfortunately buried with him.

Educated before the modern age of highly organized ancillary hospital services, he was outspoken in his criticism of the practitioner who "rushes to the roentgenologist and laboratory technician for his diagnoses before giving the patient a preliminary physical examination." A fearless champion of a just cause, he was a loyal friend to the bewildered young practitioner, and especially to the highly qualified immigrant doctors who had hopefully sought refuge in Canada only to find innumerable restrictions placed in their way. "Tchappy" was a reticent man, and his basic shyness was often misconstrued by those who did not work in close contact with him. Perhaps only a few knew his innermost thoughts and ideas and his ultimate goal for cancer research. To those especially his passing is a great personal loss.

DONALD McINTYRE, M.B.E., M.D., F.R.C.S.Ed. F.R.F.P.S., F.R.C.O.G.

The obituary of Dr. Donald McIntyre was printed in the *Journal* of October 30 (p. 1051). We are indebted to Professor George M. Wyburn for the following appreciation:

Dr. Donald McIntyre, although a practising gynaecologist and obstetrician, always maintained close contact with the embryological section of the anatomy department of Glasgow University, and indeed he was well known and recognized as an authority on many aspects of the early development of the human embryo. The embryologist is at all times dependent on the co-operation and help of his obstetrical colleagues to produce material to work on. Donald McIntyre not only co-operated but was himself an enthusiastic and well-informed authority on embryology. Two of the most beautiful specimens in the Glasgow collection—the McIntyre 1 and the McIntyre 2—were given to the department back in the 'twenties in the time of Professor T. H. Bryce. The McIntyre 1, an embryo of about 1.4 mm., provided the material for a monograph by Bryce—"Observations on the Early Development of the Human Embryo," published in the *Transactions of the Royal Society of Edinburgh* in 1924. This embryo, which at that time ranked as one of the youngest human specimens, gave Bryce the opportunity to add to our knowledge of the early processes of human embryology. From the same specimen Dr. McIntyre recorded his observations, "The Development of the Vascular System in the Human Embryo Prior to the Establishment of the Heart," also published in the *Transactions of the Royal Society of Edinburgh* in 1926. This monograph has since provided a base-line for further work on the embryonic vascular system and is regarded as a classic in its own field. Embryology in Glasgow has always been fortunate in having the interest and co-operation of obstetrical colleagues, and this is in large measure due to the close association started by Teacher in the early part of the century and maintained by Dr. Donald McIntyre throughout his lifetime.

G. R. JEFFREY, M.D., F.R.C.P.Ed.

D. M. G. writes: I knew the late Dr. George Rutherford Jeffrey, whose obituary was printed in the *Journal* of October 30 (p. 1053), from 1926 until his death, a matter of nearly 30 years. During that time I was constantly aware of his strong character under all circumstances, both in his professional life, where I was for a short time associated with him, and also since his retirement, which was unfortunately early owing to ill-health. I remember still a great deal of valuable experience gained under him, when physical treatments in psychiatry were less in evidence than they are to-day. I left the specialty years ago, but was fortunate to remain in close touch with Dr. Jeffrey. His canny sense of humour was always as ready as his sympathy and understanding, while his firmness when necessary commanded great respect. He is deeply mourned both by his professional colleagues and by his friends.

Dr. MANFRED ALTMANN, who, with his wife, was killed in a motor accident in Switzerland on September 2, came from an ancient Frankfort family; he was a grandson of the celebrated Rabbi Samson Raphael Hirsch. A fine physician, he had received his training as assistant to Professor Herman Strauss at the Jewish Hospital and to Professor Umber at the Westend Hospital in Berlin. When he settled down in practice in London in 1934, the year in which he took the London conjoint diplomas, his patients included the poor and the destitute, to whom he gave advice and help, medical as well as material, unstintingly and without any thought of reward. In his quiet, imperturbable manner he searched deeply at the bedside and would go on trying where others had given up. Later on he specialized in radiology and radiotherapy, obtaining the Cambridge D.M.R.E. in 1941. Uncommon understanding and knowledge of biophysics enabled him to widen the horizon of his daily work as assistant radiotherapist at Guildford. A graceful and distinguished figure, Altmann was a man with wide cultural interests. During the air raids on London, and while on military service from 1944 to 1946, he studied ancient Greek in order to be able to read Plato in the original. He was also an accomplished pianist, and to hear him interpret Bach in his beautiful Hampstead house was an unforgettable experience. His death at the age of 54, merciful only in its suddenness, dealt a stunning blow to many friends and grateful patients, tearing him and his wife away far too early from a fully active and happy life.—W. P.

Dr. L. G. GELBER died in the Central Middlesex Hospital on October 3 at the age of 37. Ludwik George Gelber, who was born at Lwow, Poland, on April 15, 1917, came to the United Kingdom in 1940 and graduated M.B., Ch.B. at the Polish School of Medicine at Edinburgh in 1943. In the following year he was appointed to the Polish Parachute Brigade as a medical officer, having previously served as a cadet officer with the Polish Forces. After the war he held appointments at St. Ebba's Hospital, Epsom, and Mabledon Park Hospital, Tonbridge, until 1947, when he became psychiatric registrar at Cane Hill Hospital, Coulsdon. He took out naturalization papers in 1948.

A. G. writes: Few men can have had so many friends as Dr. Ludwik Gelber. When he joined the staff of Cane Hill Hospital he brought to his work a directness, energy, and breadth of view that refreshed both his colleagues and his patients. His zest for life, his peculiarly free and happy nature, and his wide knowledge of the vagaries of human beings made him a fine psychiatrist as well as a sound physician. His energy and his wholesome normality led him to touch life at many points. This very liveliness made it a sobering experience for his colleagues to work in close contact with him for almost a year knowing that his days

were numbered. During that year he inspired many people with admiration and even wonder at the depth and integrity of his philosophy. His open acknowledgment and his objective acceptance of his fate without pretence, self-pity, or falsity of any kind made a profound impression upon his colleagues. One who went to see him after he had had a palliative operation came away in humility in the realization of how explicitly he had made the meeting less distressing. Paradoxically he created the feeling, not of the imminence of death, but of the excitement of life. His professional interests were wide, but he made a particular study of electroplexy and of special methods of group treatment. His personal discipline was exacting, but he was generous and devoted to his patients, and with true gentlemanliness had time for the humblest on all occasions. His inherent zest for freedom was probably accentuated by his wartime experiences. As a prisoner of war he suffered much. As a paratroop captain he led his company in a daring breakout at Arnhem. It was from one of his brother officers that one heard of his adventures and of his gallantry. He rarely spoke of these things and never of his awards. In some way Gelber belonged to another age: he had a crusading way about him, a combination of soldier, scholar, and explorer that brought to his hospital home at Tunbridge Wells numerous interesting people. There are many who would wish, through your columns, to convey deep and sincere sympathy to his wife, Dr. Florence Gelber, and to their children.

Dr. PHILIP EGGLETON, reader in biochemistry at Edinburgh University, who died on October 7, was educated at the Tiffin Grammar School, Kingston-on-Thames, and at University College, London, where he obtained an honours degree in chemistry in 1922. After graduating Eggleton turned his attention to biochemistry and physiology, and in 1925 joined the staff of Professor A. V. Hill's laboratory, where the foundations of the modern knowledge of muscle chemistry were being laid. He was awarded a Beit Memorial Fellowship in 1926, and during the next four years, when working with Grace Eggleton, he made his most important discovery of the nature and function of creatine phosphate in muscle. At the time attention was focused on the production of lactic acid as the sole source of energy for contraction under anaerobic conditions, and the Eggletons' work directed attention to the transfer of phosphate, a process now known to be much more closely linked with the mechanical changes. Eggleton was awarded the Julius Mickle Fellowship in 1931 for the best research work carried out in London University during the previous five years. In 1930 he went to Edinburgh at the invitation of Sir Edward Sharpey-Schafer, who expressed the opinion at the time that physiologists now had to have as much knowledge of chemical methods as previously they had to have of physical methods. Eggleton took charge of the teaching of physiological chemistry to medical students and postgraduates. He was a very successful teacher, with a happy knack of simplifying complex subjects. His warning that if you grind up a motor car a number of new processes will occur, including solution of the tyres by the petrol, has not always been heeded by enthusiastic workers on minced tissues. The name of "carbonic anhydrase" was another of his happy suggestions. He was unable to take up a Rockefeller Fellowship in 1939 owing to the outbreak of war. He took part in wartime work on phosgene and decompression, and was in charge of the department for a total of five years between 1943 and 1950. In 1949 the teaching of medical students was taken over by the department of biochemistry, and Eggleton turned to the task, more congenial perhaps, of teaching for the honours class in physiology. Here his lucidity and his lifelong interest in the basic physical chemistry of biological processes provided an invaluable influence on a small but growing school. His interests in physical chemistry led him to work on problems of decompression sickness, diffusion of gases through oils, and on problems of viscosity and rheology in biology. His colleagues could rely on help, great kindness, and quick illumination of the heart of their problem when they turned to him for advice. This they frequently did, and in recent years his reputation in the outside world would have been still greater had it not been for the time, trouble, and insight he contributed to the work of others.

Dr. JOHN DAVIDSON died at his home at Sheffield on October 15 after a prolonged illness. He was 64 years of age. John Davidson was born on July 9, 1890, the son of Dr. G. S. Davidson, and was educated at St. Bees School, Cumberland, and at Sheffield University, where he graduated M.B., Ch.B. in 1913. After graduation he held a resident post at the Jessop Hospital for Women, and then made a voyage to the Far East as a ship surgeon. On the outbreak of the first world war in 1914 he joined the R.A.M.C. and went to France with the British Expeditionary Force as medical officer to a regular infantry battalion. He was invalided home and then served in military hospitals until the end of the war, when he returned to Sheffield to enter his father's practice, to which he eventually succeeded and which he carried on until just before his death. Dr. Davidson was for many years an honorary anaesthetist at the Jessop Hospital, and among his many appointments were those of appointed factory surgeon, and medical officer to the Sheffield Training College for Teachers and to the Post Office. Of a kindly and sympathetic disposition, he devoted himself to his patients, by whom he was greatly beloved, as was shown by the large attendance at the funeral service. He leaves a widow, a son, and a daughter.—J. H. C.

Dr. M. F. MURPHY died at his home at Reading on October 16 after a long and trying illness borne with the greatest courage and without a single complaint. He was 64 years of age. Michael Francis Murphy was born at Berehaven, Co. Cork, on October 3, 1890, and received his early education at Douai School. He studied medicine at Dublin and obtained the diplomas of the Irish Royal Colleges in 1916. After qualification he joined the R.A.M.C., serving first in East Africa and later with the King's African Rifles in the campaign in Somaliland in 1920. On his return to civilian life he became a house-physician at the Royal Berkshire Hospital, Reading, before entering general practice in the town. In due course he was appointed assistant anaesthetist to the hospital, a post which he held until his death. His other public appointments included those of police surgeon and prison medical officer. He was also master of the Reading branch of the Guild of St. Luke, SS. Cosmas and Damian. Murphy was a delightful person whose outstanding characteristic was a kindly, quizzical humour with which he never failed to entertain any company in which he might be found. This kindly manner and good humour meant much to his patients, and none can ever have failed to feel better after a visit from him. Beneath the surface, however, was a thoughtful person interested in his profession and very widely read in all kinds of literature and able to discuss a wide range of subjects with authority. In his early days in Reading he played, and later refereed, for the Berkshire Wanderers Rugby Football Club, and he was also fond of fishing, shooting, tennis, golf, bridge, and, of course, as an Irishman, of horse racing: if he had any spare time it was not likely that he would waste it. His was a rounded, balanced personality, and his death will leave a gap in Reading not easy to fill. He will be widely missed by a large circle of friends and patients whose deep sympathy will go out to Mrs. Murphy, whom he married in 1922, and to his sons and daughters.

A surgical colleague writes: Although working in the isolation of a single-handed practice, Dr. Murphy maintained contact with the advances of medical knowledge in many ways, especially through his anaesthetic work at the Royal Berkshire Hospital, and it was probably to this work that he owed his wide knowledge and sound judgment in surgical matters. He was an extremely good and reliable anaesthetist. He wisely preferred to be somewhat conservative in his methods: the record of a quarter of a century's

work in anaesthetics without a death is probably unique. His surgical colleagues will remember him best for his skill in puncturing their conceit when they thought they had done something clever, and also for his unruffled demeanour in moments of stress.

Dr. ROBERT DUNCAN, who was in general practice at Richmond, Surrey, for over 40 years, died in the Royal Hospital there on October 24 at the age of 75. Born at King Edward, near Banff, on August 28, 1879, Robert Duncan graduated M.B., Ch.B. at Edinburgh University in 1906. He then became house-surgeon at the Royal Hospital, Richmond, before starting in general practice in the town, where he remained until he retired in 1947, except during the first world war, when he served in the R.A.M.C. in India and Mesopotamia. On his return to civilian life he was appointed to the staff of the Richmond Hospital as surgeon. He combined the work of a busy general practitioner and that of hospital surgeon with the greatest success for many years. A member of the British Medical Association for nearly 45 years, he was almost entirely responsible for reforming the Richmond Division in 1930, and acted as its tireless honorary secretary from 1929 to 1946. He was also for some years a member of the Surrey Insurance Committee. Of a retiring disposition, he took little part in public life, his main hobbies being reading and gardening. His work always came first, and he will be remembered by many grateful patients in his practice and in the hospital. Since his retirement he had lived at Reading with his daughter. His wife died 27 years ago, and his only son some years later. His elder brother, Sir Patrick Duncan, was Governor-General of South Africa from 1937 until his death in 1943, having previously held office in the Union as Minister of the Interior, Public Health, and Education, and as Minister of Mines.

Medical Notes in Parliament

CLEAN FOOD BILL

The committee stage of the Food and Drugs Amendment Bill was concluded on November 3. On Clause 10 (provisions relating to milk) Dr. CHARLES HILL, Parliamentary Secretary, Ministry of Food, accepted a Conservative amendment to include skimmed or separated milk within the powers requiring milk to be treated before it was sold. Dr. EDITH SUMMERSKILL (Fulham, West, Lab.) moved an amendment authorizing regulations to control the use of milk churns, bottles, and crates. She condemned the irresponsible and careless use of such receptacles which endangered public health. Dr. HILL acknowledged the difficulty, and even the danger, caused by the misuse of milk bottles—they were even used in connexion with a "home perm"—and said it had been discussed with the trade, but such regulations by their very nature could not be enforced without domestic "snooping." Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab) suggested that some warning might be put on the bottle in the process of manufacture. He spoke about boys knocking off the caps and putting a mouse into the milk, which he said had resulted in heavy fines on dairymen and the owners of sterilizing plant because it was assumed that the mouse got in during the sterilizing process. Dr. SUMMERSKILL said that the Minister's argument might have been acceptable 30 years ago, but in her opinion the public were now ready for such a measure. The amendment was rejected by 246 votes to 215.

Mr. AMORY said it was the Government's intention to introduce a consolidation measure as quickly as possible, because the Bill would be extremely difficult to understand. Their intention was, if possible, to make effective simultaneously this Bill, the consolidation measure, and as many of the regulations as possible. Next January was a little too soon, but it was hoped to bring all of them into operation in the early months of next year.

SCOTTISH HOSPITAL ENDOWMENTS

A series of orders giving effect to the Scottish Hospital Endowment Schemes were discussed in the House of Commons on November 1. Mr. ARTHUR WOODBURN, a former Secretary of State—who moved, for the purpose of debate, a motion against the orders which he had not the slightest intention of pursuing—said the intention was to mark the completion of the task set the Hospital Endowments Commission to distribute endowments under the 1947 Act. He said the trust had been allotted an income of £120,000 a year by the 1953 Act, and Sir John Erskine, its chairman, reported that the trust was in good heart and had already started to extend research work. Mr. Woodburn suggested that the House should consider recommending to hospitals that part of the funds should be used for raising the spirit of enthusiasm among Scottish nurses. The greatest possibility of improvement in hospitals, he thought, lay in the conditions of the out-patient departments. The hospital and its purpose of healing was now the responsibility of the State. Such funds as these made it possible for hospitals to consider amenities in a quite different way from the approach that was necessitated in former days by financial stringency.

Mrs. JEAN MANN (Coatbridge and Airdrie, Lab.) suggested that, if necessary, the endowment funds might be used to modernize the instruments used by young surgeons in Scottish hospitals; and that research might be concentrated in channels that were at the moment proving distressing to the medical profession. Mr. G. LAWSON (Motherwell, Lab.) preferred that the money should be used for the normal purposes of running a hospital.

Commander T. D. GALBRAITH, Under Secretary, Scottish Office, answered complaints about the smallness of some prizes for nurses with the statement that the boards were free to extend the prizes; the endowments specifically mentioned were in continuation of the wishes of people who had given money for that purpose, probably many years ago. The Endowments Commission had established that every board should have a reasonable fund at its disposal, and the Research Trust would get about £100,000 a year from the total of about £450,000. No board of management would be left with less than £2 a bed, and many would have considerably more.

Smog Analysis Preparations

Mr. NORMAN DODDS (Dartford, Lab.) asked the Parliamentary Secretary to the Ministry of Works, as representing the Lord President of the Council, what progress had been made in the preparations to take special measurements of air pollution if smog conditions similar to those of 1952 should again occur this winter; and what was the purpose of taking the measurements.

Mr. J. R. BEVINS stated on November 2 that detailed arrangements had been made by the Department of Scientific and Industrial Research in co-operation with local authorities to measure smoke and sulphur dioxide and to identify other pollutants this winter in the London area. During any period of persistent smog, Civil Defence volunteers would help in taking measurements. Mr. DODDS asked whether, if there were smog next week, volunteers would be able to get down to the job. Mr. BEVINS said the answer to that was a definite affirmative.

Carcinogens in Cigarette Paper

Mr. JOHN HALL (Wycombe, Con.) asked the Minister of Health on November 4 what evidence he had to show the relative importance of cigarette paper as against tobacco as a factor in causing lung cancer. Mr. IAIN MACLEOD stated that the statistical association between heavy cigarette-smoking and cancer of the lung had led to intensive attempts to detect carcinogens both in cigarette tobacco and in cigarette paper. So far these were inconclusive, but recent publications in this country indicated the presence of certain chemical substances with such carcinogenic

potentialities in the combustion products of cigarette paper. He understood that further research had also indicated their presence in tobacco.

Group Practices

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health whether he would encourage the provision of facilities for some of the local health authority's services wherever group practices were established, and especially where applications had been made to the Group Practice Loans Fund. Miss PAT HORNSBY-SMITH, Parliamentary Secretary, replying on November 1, said it was for the doctors forming a group practice to decide what facilities they would provide, but the Minister of Health was sure that they appreciated the advantages of the closest possible contact with the local health authorities' services.

Medico-Legal

DIVORCE AND THE M'NAGHTEN RULES

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

One reason why controversy rages so acutely round the M'Naghten Rules is that the field in which they usually fall to be applied is prosecution for murder, when conviction necessarily involves the death penalty. It is extremely rare to find a plea of insanity raised in prosecutions for other crimes, because a prison sentence of definite duration is generally less unattractive than the prospect of detention in Broadmoor during Her Majesty's pleasure.

There is, however, another field in which the rules have to be applied where there has been considerable recent development in the law which has not been achieved without judicial disagreement. This field deserves the attention of M'Naghten controversialists, because the problem can be studied without the heat engendered by the imminence of the death penalty. It has now been said by the Court of Appeal that insanity of such a nature as to satisfy either limb of the M'Naghten Rules will constitute a good defence to a charge of cruelty in proceedings for divorce.[1]

In 1945 the question came before the Scottish court in *M'Lachlan* v. *M'Lachlan*,[2] in which the cruelty relied on was violent and threatening behaviour by the husband in an epileptic seizure during which he was temporarily irresponsible. Lord Moncrieff, having stated the argument for the husband that to be "guilty" of "cruelty" involved both intention and malice, that unconscious cruelty was a contradiction in terms, and that a man who was insane could not be guilty of cruelty, went on to say that the proposition was entirely logical in relation to certifiable insanity but could not be accepted where the wife had not the remedy of getting the husband certified for her protection.

The question was canvassed by the Court of Appeal in England in *White* v. *White*.[3] Lord Justice Denning expressed the view that the fact that the spouse accused of cruelty did not know the nature and quality of his acts was of itself no answer to a petition for divorce on the ground of cruelty, because the relief afforded to the petitioner in the Divorce Court was not a matter of punishment of the offending spouse but was to safeguard the petitioner from an intolerable situation, and that the presence of mental disease made the relief more, not less, necessary.

Lord Justice Asquith on the other hand took the contrary view and expressed the opinion that if a man did not know the nature and quality of his acts, as he would not during an epileptic seizure, he could not be guilty of cruelty.

That case was decided against the husband on the ground that the evidence did not show that he did not know the nature and quality of his acts, but the same question came before a differently constituted Court of Appeal three years later.[4] The Court then unanimously decided that someone who was at the time insane within the first limb of the M'Naghten Rules could not be said to have treated his spouse with cruelty, but left open the question whether insanity within the second limb, where, although knowing the nature and quality of his act, the person charged in divorce proceedings with cruelty had not known that his acts were wrong, would amount to a good answer.

In *Palmer v. Palmer*[5] the Court of Appeal, again differently constituted, expressed the view that insanity within the second limb of the rules would afford as good a defence as insanity within the first limb had been held to do. The case was, however, decided on the ground that the evidence had not established that the husband in assaulting his wife did not know that what he was doing was wrong.

The law is accordingly in a somewhat unsettled state, and would be greatly helped by an authoritative decision by the House of Lords.

HOT-WATER BOTTLE BURNS

The damages of £7,000 awarded to Mrs. M. J. Farley[6] because of burns on her thighs caused by hot-water bottles were reduced to £3,000 by the Court of Appeal on November 8.[6] The North-East Metropolitan Regional Hospital Board and the Edmonton Group Hospital Management Committee had admitted liability, and the only issue was the amount of damages. The patient had been burned on both thighs, and there was now a scar 9 × 3½ in. (23 × 9 cm.) on the left thigh. The patient had suffered much pain and still takes sleeping tablets every night. Lord Justice Denning, delivering the judgment, said that there must be some limit to the amount of money that could be awarded in these cases. Damages could get so high that they were out of all proportion. In this case the proper sum would be £3,000. Lords Justices Morris and Parker concurred.

Vital Statistics

Infectious Diseases

The largest fluctuations in the trends of notifications of infectious diseases in England and Wales during the week ending October 23 were increases of 653 for measles, from 2,801 to 3,454, and 151 for whooping-cough, from 1,393 to 1,544, and a decrease of 53 for dysentery, from 507 to 454.

The largest increases in the incidence of measles were 321 in Lancashire, from 1,052 to 1,373, 39 in Nottinghamshire, from 51 to 90, and 46 in Staffordshire, from 49 to 95, while the only large exception to the increasing trend was a fall of 56 in Somersetshire, from 98 to 42. After rising steadily for 5 weeks the number of notifications of scarlet fever declined by 28, from 777 to 749; no large variations were recorded in the local trends during the week reviewed. The largest fluctuation in the returns for whooping-cough was a rise of 22 in Lancashire, from 185 to 207. The number of notifications of diphtheria rose from 13 to 23, and with one exception was the largest total for any week of this year.

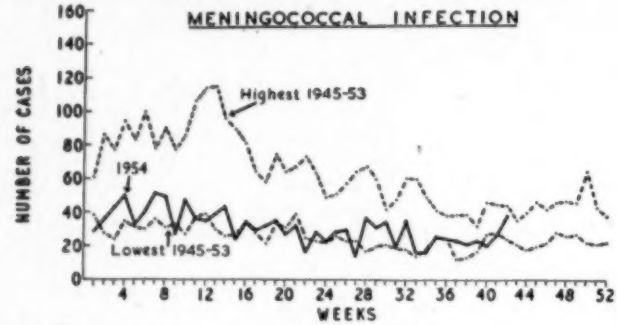
62 cases of acute poliomyelitis were notified during the week; these were 11 fewer for paralytic and 2 more for non-paralytic cases than in the preceding week. The largest returns were Gloucestershire 7 (Cheltenham M.B. 2, Gloucester R.D. 2), Lancashire 5 (Liverpool C.B. 2), Yorkshire West Riding 5 (Sheffield C.B. 2), Durham 5 (Gateshead C.B. 2, Stockton-on-Tees M.B. 2).

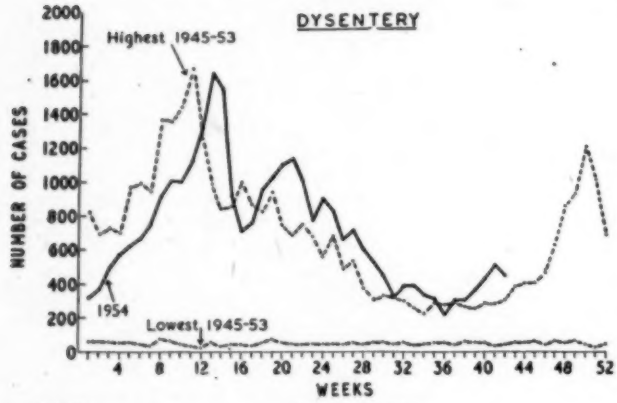
The largest centres of dysentery were Lancashire 136 (Liverpool C.B. 38, Oldham C.B. 31, Mossley M.B. 19, Manchester C.B. 10), Yorkshire West Riding 66 (Sheffield C.B. 23), London 43 (Southwark 11), Durham 27 (Stanley U.D. 9), Middlesex 22, Glamorganshire 16 (Cardiff C.B. 10), and Leicestershire 16 (Leicester C.B. 13).

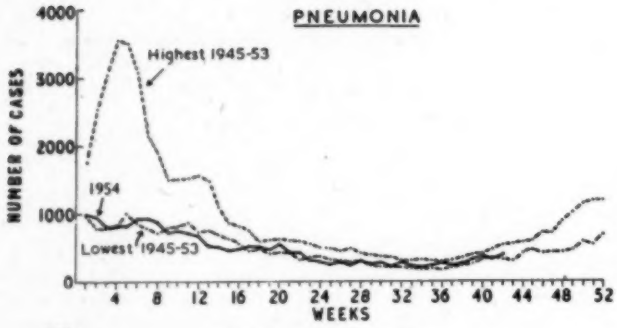
[1] *Palmer* v. *Palmer*. *The Times*, October 29, 1954.
[2] 1945, s.c. 382.
[3] [1950], p. 39.
[4] *Swan* v. *Swan*. [1953], p. 258.
[5] *British Medical Journal*, 1954, **2**, 250.
[6] *The Times*, November 9.

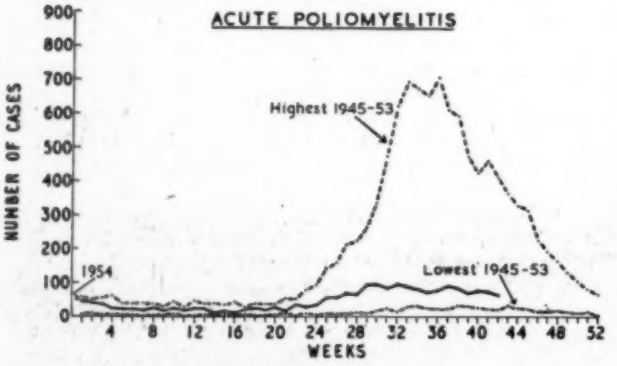
Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1945–53 are shown thus - - - - - - -, the figures for 1954 thus ———. Except for the curves showing notifications in 1954, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.









Week Ending October 30

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 694, whooping-cough 1,692, diphtheria 8, measles 3,806, acute pneumonia 368, acute poliomyelitis 70, dysentery 424, paratyphoid fever 16, and typhoid fever 6.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending **October 23** (No. 42) and corresponding week 1953.

Figures of *cases* are for the countries shown and London administrative county. Figures of *deaths* and *births* are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1954 Eng. & Wales	1954 Lond.	1954 Scot.	1954 N. Ire.	1954 Eire	1953 Eng. & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire
Diphtheria	23	3	2	0		24	3	7	0	
Dysentery	454	43	183	9		212	29	139	0	2
Encephalitis, acute	4	1		0		7	0	0	0	
Enteric fever:										
Typhoid	7	0	0	1		10	5	0	1	3
Paratyphoid	6	0	1 (B)	0		16	1	1	0	1
Food-poisoning	181	56		2		260	16		0	
Infective enteritis or diarrhoea under 2 years				21	14				19	48
Measles*	3,454	204	447	79	143	621	9	69	17	29
Meningococcal infection	38	4	7	0		22	2	11	0	2
Ophthalmia neonatorum	36	2	7	0		42	5	1	0	
Pneumonia†	400	24	117	2	2	322	16	109	5	2
Poliomyelitis, acute:										
Paralytic	39	4	} 26	1	1	{ 79	4	} 9	16	6
Non-paralytic	23	0				{ 78	6			
Puerperal fever§	265	44	12	1	1	237	38	9	3	
Scarlet fever	749	48	161	23	33	992	61	194	38	62
Tuberculosis:										
Respiratory	794	63	135	43				126	27	
Non-respiratory	122	8	15	10				22	6	
Whooping-cough	1,544	86	213	12	36	2,292	142	224	26	47

DEATHS in Great Towns	1954 Eng. & Wales	1954 Lond.	1954 Scot.	1954 N. Ire	1954 Eire	1953 Eng. & Wales	1953 Lond.	1953 Scot.	1953 N. Ire.	1953 Eire
Diphtheria	1	0	0	0	0	0	0			0
Dysentery	0	0		0		0	0			
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0			
Infective enteritis or diarrhoea under 2 years	8	0	2	0	0		3	1	0	2
Influenza	6	0	0	0	0	4	0		0	0
Measles		0	0	0	0		0			0
Meningococcal infection		0	0				0			
Pneumonia	156	27	24	13	7	135	18		6	5
Poliomyelitis, acute	2	0			0	6	0			0
Scarlet fever		0	0	0	0		0			0
Tuberculosis:										
Respiratory	} 68	{ 6	10	0	7	} 84	{ 11	7	3	1
Non-respiratory		{ 2	10	2	0		{ 0	3	0	2
Whooping-cough	1	0	0	0	0	1	0		0	0
Deaths 0–1 year	186	28	29	7	15	207	31	30	10	12
Deaths (excluding stillbirths)	4,665	691	567	87	167	4,495	606	509	87	141
LIVE BIRTHS	7,155	1151	832	225	490	7,769	1189	854	199	385
STILLBIRTHS	173	18	20			194	24	17		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Rheumatism Research.—Now that cortisone and A.C.T.H. are found to be of much more limited use in the treatment of chronic rheumatic diseases than was at first suggested, the Nuffield Foundation has begun to revise its programme of research. During the past five years it has been supporting much work on adrenal hormones, but it is now reverting to its original policy of supporting fundamental and clinical research into the nature of rheumatic diseases. It announces a grant of £70,000 over eight years to Manchester University to extend the work being carried out at the rheumatism centre under Professor J. H. KELLGREN. A sum of £27,000 has been provided to meet the cost of a new building for the rheumatic unit directed by Dr. J. J. R. DUTHIE at the Northern General Hospital, Edinburgh, and over the next five years £38,000 will be provided to assist the unit's work. Sheffield University receives £8,000 to finance a research fellowship in the rheumatism centre directed by Dr. H. F. WEST, and £6,000 has been given to the Oxford Regional Hospital Board for an experimental pathologist to work at Stoke Mandeville Hospital under Dr. A. G. S. HILL on the pathogenesis of rheumatic diseases.

General Practice Adviser.—Dr. W. S. MACDONALD has been appointed to the staff of the Ministry of Health as Adviser on General Medical Practice. He will take up his appointment early in the new year. Dr. Macdonald will advise the Ministry on problems in this field, including questions of organization and practice management, and the relation and integration of general practice with other branches of the Health Service. Educated at Edinburgh University, Dr. Macdonald has been in general practice in Leeds since 1925. He is aged 57. He was a member of the Minister's Medical Advisory Committee from 1942 until its supersession by the advisory machinery set up under the National Health Service Act; is a member of the Standing Mental Health Advisory Committee; served as a member of the Leeds Regional Hospital Board during 1947–50; and has for many years been a member of the Medical Advisory Council of the Nuffield Provincial Hospitals Trust.

Dr. H. J. Eysenck, Ph.D., reader in psychology with special reference to psychiatry at the Institute of Psychiatry, has been appointed to the London University chair of psychology tenable at that institute.

Professor S. G. Graham, professor of child health at Glasgow University, has been elected president of the Royal Faculty of Physicians and Surgeons of Glasgow in succession to Dr. ANDREW ALLISON.

All-India Institute of Medical Sciences.—The architectural firm of Messrs. H. J. Brown and L. C. Moulin in association with A. H. Antrum, of London and Madras, have won an architectural competition for the main group of this Institute's buildings. They are to be erected on the outskirts of New Delhi. The Government of India will meet most of the cost, estimated at £3m., while the New Zealand Government has voted £1m. towards the project. There will be 600 hospital beds, a dental college, and provision for about 300 undergraduates and 100 postgraduates.

E.N.T. Prize.—The North of England Otolaryngological Society offers a prize of fifty guineas for original work in otolaryngology. Candidates must be of registrar, senior registrar, or clinical assistant status, or must have been holding such a post while the investigation was in progress. The work must have been carried out in the North of England, and the paper must be submitted by July 1, 1955, to the hon. secretary, North of England Otolaryngological Society, 28, St. John Street, Manchester, 3.

Rockefeller Foundation Grants.—Among grants recently announced by the Rockefeller Foundation are the following:

Strangeways Research Laboratory, Cambridge (director, Dr. HONOR B. FELL, F.R.S.), $30,000 for the purchase of an electron microscope.

Biophysical Research Unit (director, Dr. J. T. RANDALL, F.R.S.), King's College, London University, $30,000 over the next three years. Studies of collagen and of the structure and function of nucleic acids will be prominent.

The Royal Institution (director, Sir LAWRENCE BRAGG, F.R.S.), $15,000 for a two-year period, to help research on the structure of proteins.

Birmingham University, $15,000 to support research into the chemistry of carbohydrates under Professor M. STACEY, F.R.S.

Durban Medical School of Natal University, $127,000 for a five-year period, to institute a department of family practice. The objective of the new department is "to provide a setting for continuous training and curative medical care outside the hospital wards in the health centres and homes of the community."

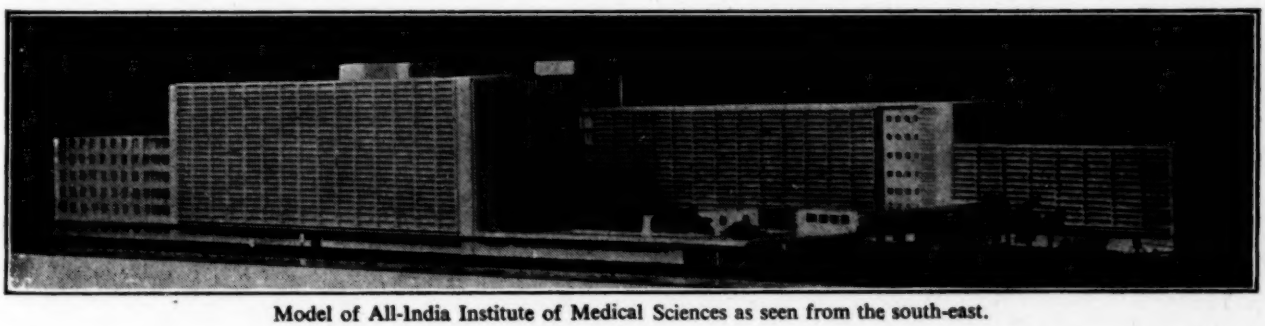
International Diabetes Federation.—This Federation offers financial help to two young British medical scientists, under 30 years of age, who wish to attend the congress to be held by the Federation at Cambridge on July 4–8, 1955, and perhaps to deliver a short scientific paper. Applications to the British Diabetic Association, 152, Harley Street, London, W.1, with covering credentials from heads of department, before December 31, 1954. A short synopsis of any proposed paper should be sent with, or as soon as possible after, the application.

Lord Nuffield has given a further £50,000 to the Royal National Institute for the Blind and St. Dunstan's so that they may bring up to date their system of talking books for the blind. The library includes long-playing records on which books are recorded, and the blind people can play them in their own homes. About 4,000 use the library, and more than 600 titles are available.

Ophthalmic Prize.—The council of the Ophthalmological Society of the United Kingdom offers the Treacher Collins prize of £100 for the best essay on "Diseases of the Lacrimal Apparatus and their Treatment." Details from the hon. secretary, Ophthalmological Society of the United Kingdom, 4, Lincoln's Inn Fields, London, W.C.2.

Professor E. J. Wayne has been appointed honorary physician to Her Majesty the Queen in Scotland in the room of Professor Sir JOHN MCNEE, resigned.

Mr. G. I. Scott has been appointed the first holder of the Forbes chair of ophthalmology in the University of Edinburgh. Mr. Scott has been ophthalmic surgeon to the Royal Infirmary, Edinburgh, and among his other appointments is membership of the Vision Committee of the Medical Research Council.



Model of All-India Institute of Medical Sciences as seen from the south-east.

Aureomycin and Terramycin.—The Ministry of Health states that many prescriptions for aureomycin capsules and terramycin tablets have not given the strength of capsules or tablets to be supplied. Consequently pharmacists have not been able to accept these prescriptions, and the necessity to refer them back to the doctor for completion causes delay and inconvenience to the patients.

Professor B. G. Maegraith, dean of the Liverpool School of Tropical Medicine and professor of tropical medicine, has been awarded the LePrince Medal and Award by the American Society of Tropical Medicine.

Professor Wilder G. Penfield, O.M., received the honorary degree of doctor of science from Leeds University on November 5.

COMING EVENTS

Harben Lectures.—Professor E. B. CHAIN, F.R.S. (scientific director of the International Research Centre for Chemical Microbiology, Rome), will lecture on "The Biochemical Approach to Biological Phenomena" at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W.1, at 5 p.m. on December 13, 14, and 15.

Oxford-Bart's Club.—Annual dinner on December 17 at 7.30 p.m. at the Royal College of Surgeons. Those wishing to attend should contact Mr. A. FAIRBAIRN at St. Bartholomew's Hospital, London, E.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, November 15

BRITISH ASSOCIATION OF SPORT AND MEDICINE.—At Westminster Hospital Medical School, 5.15 p.m., subject: The Heart in Athletes.

HUNTERIAN SOCIETY.—At Apothecaries' Hall, 8.30 p.m., discussion: That Litigation is now the Patient's Best Friend. Proposed by His Honour Judge Sir Edgar T. Dale and Dr. W. J. O'Donovan. Opposed by the Hon. J. R. Cumming-Bruce and Dr. K. R. McFadyean. To be summed up by the Hon. Mr. Justice McNair.

●INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. R. A. Henson: Disturbances of Vision: Due to Lesions of Optic Nerve and Optic Tracts.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., lecture demonstration by Dr. E. Stengel.

LONDON UNIVERSITY.—At Guy's Hospital Medical School, 5.15 p.m., special university lecture in pharmacology by Dr. Christian Hamburger (Copenhagen): On the Excretion of 17-Ketosteroids in Human Urine.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor A. Kekwick.

Tuesday, November 16

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. J. P. Bull: Shock from Burns.

ILFORD MEDICAL SOCIETY.—At King George Hospital, Ilford, 8.45 p.m., Mr. W. O. J. Robinson: Disciplinary Procedure.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Radcliffe Infirmary, 8.15 p.m., Dr. Mary H. Macaulay: Family Planning—Past and Present.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Mr. Ian A. Donaldson: The Menopause.

SOCIETY OF APOTHECARIES OF LONDON.—4.30 p.m., Professor A. C. Frazer: Causes and Treatment of Steatorrhoea; 5.45 p.m., Professor D. M. Dunlop: Present Status of Cortisone in Therapeutics.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., neurological demonstration by Dr. D. Gordon.

Wednesday, November 17

EUGENICS SOCIETY.—At Royal Society, Burlington House, W., 5.30 p.m., Dr. Christopher Ounsted: Genetic and Social Aspects of the Epilepsies of Childhood

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. A. Dudgeon: Viral Diseases of the Skin.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY.—5.30 p.m., Professor F. C. Ormerod: Otogenic Brain Abscess.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. G. Sandrey: Urological Emergencies in General Practice.

LONDON UNIVERSITY.—At University College Hospital Medical School, 5 p.m., special university lecture in medicine by Professor T. N. A. Jeffcoate: Pruritus Vulvae.

MIDLAND MEDICAL SOCIETY.—At General Hospital, Birmingham, 8.15 p.m., clinical meeting.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY.—8.30 p.m., Dr. D. G. French: Clinical Research in General Practice.

OXFORD UNIVERSITY MEDICAL SOCIETY.—At Clarendon Laboratory, 8.15 p.m., Dr. M. P. Leahy: Hypnotism and Suggestion in Treatment.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor F. L. Warren: Electrophoresis of Plasma Proteins.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. J. Tudor Lewis: Housing—Some Modern Problems. (Illustrated.)

●ROYAL SOCIETY OF ARTS.—2.30 p.m., E. Frankland Armstrong Memorial Lecture by Dr. L. H. Lampitt, D.Sc., F.R.I.C.: Science and Food Production. (Illustrated by lantern slides.)

WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—8.45 p.m., discussion: Medical Litigation—a Dagger. Guest speaker: Dr. R. Forbes.

Thursday, November 18

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. A. G. Everson Pearse: Histochemistry and its Application to the Basic Sciences.

EDINBURGH CLINICAL CLUB.—At 7, Drumsheugh Gardens, 8 p.m., Sir Andrew Davidson: Basic Health Problems.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—At Glasgow University Union, 7.30 p.m., Mr. W. W. Galbraith: Urology, its History, Scope and Practice.

HONYMAN GILLESPIE LECTURE.—At University New Buildings, Edinburgh, 5 p.m., Dr. John Marshall: A Clinico-Pathological Study of Spastic Paraplegia in Middle Life.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Symposium to be opened by Dr. D. A. K. Black: Water and Electrolyte Balance.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Dr. W. N. Pickles: Epidemiology in Country Practice.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Clinical Theatre, Manchester Royal Infirmary, 5 p.m., Dr. F. A. H. Simmonds: Comments on Chemotherapy and Cavity Healing.

ROYAL EYE HOSPITAL.—5.30 p.m., Dr. T. H. Whittington: Non-paralytic Squint—the Aim of Modern Methods of Treatment.

ROYAL MEDICAL SOCIETY, Edinburgh.—At Royal College of Surgeons of Edinburgh, 7.15 for 7.30 p.m., President's Annual Dinner.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At Liverpool School of Tropical Medicine, Pembroke Place, 7.30 p.m., laboratory meeting.

ST. ANDREWS UNIVERSITY.—At Physiology Department, Medical School, Small's Wynd, Dundee, 5 p.m., Mr. C. S. Hallpike: Principles and Practice of Clinical Investigation of 8th Nerve Function.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. J. H. Paterson: neurology demonstration.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—At Rembrandt Hotel, S.W., 7.15 for 7.30 p.m., dinner meeting; 9 p.m., Dr. L. Griffith Pugh: Medical and Physiological Problems of the Everest Expedition, 1953.

Friday, November 19

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., clinical demonstration by Dr. M Feiwel: Occupational Dermatoses.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., clinical demonstration by Mr. W. P. Cleland.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—At Hammersmith Hospital, 3 p.m., Professor J. Chassar Moir: Urinary Incontinence.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—(1) 2 p.m., Mr. G. F. Rowbotham: Problems of the Circulation of the Brain and the Treatment of Cerebral Aneurysms. (2) 4 p.m., Dr. J. D. N. Nabarro: Treatment of Diabetic Ketosis.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—5 p.m., John Matheson Shaw Lecture by Professor J. M. Mackintosh: Research in General Practice.

●ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Professor L. J. Davis: Megaloblastic Anaemias.

ROYAL MEDICAL SOCIETY, Edinburgh.—8 p.m., Mr. W. B. Gabriel: Surgical Aspects of Chronic Ulcerative Colitis.

APPOINTMENTS

NORTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD.—W. V. Livingston, M.R.C.S., L.R.C.P., D.P.M., Full-time Consultant Psychiatrist, South Ockendon Group of Hospitals; J. S. Pippard, M.B., B.Chir., M.R.C.P., D.P.M., Full-time Consultant Psychiatrist, Claybury; M. F. Pilcher, M.B., F.R.C.S., Part-time Consultant Orthopaedic Surgeon, Central and Hackney Groups of Hospitals.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—M. C. T. Reilly, M.B., M.S., F.R.C.S., Consultant Surgeon to Plymouth Clinical Area; J. Macpherson, M.B., F.R.C.S.Ed., M.R.C.O.G., Consultant Obstetrician and Gynaecologist in Exeter Clinical Area (Torquay district); D. M. Strange, L.S.A., Senior Hospital Medical Officer, Royal Western Counties Institution, Starcross; K. Maksimczyk, M.B., Ch.B., Assistant Medical Director to the Mass Radiography Units centred at Bristol; R. L. N. Stewart, M.B., Ch.B., D.O., Ophthalmologist in the Bristol Clinical Area; G. S. Tupman, M.B., Ch.B., F.R.C.S., Senior Registrar in Orthopaedic and Traumatic Surgery, Bath Clinical Area; E. G. A. Jackson, M.B., B.Ch., F.F.A. R.C.S., D.A., Anaesthetic Registrar at Southmead Hospital, Bristol; P. K. Pybus, M.B., B.Chir., D.Obst.R.C.O.G., Surgical Registrar to Torquay and Newton Abbot Hospitals; B. R. Pollard, M.B., B.Chir., Assistant Pathologist, Frenchay Hospital, Bristol; H. M. Saxton, M.B., B.S., Medical Registrar at St. Martin's Hospital and the Royal National Hospital for Rheumatic Diseases at Bath.

WELSH NATIONAL SCHOOL OF MEDICINE.—Paul Fourman, M.D., M.R.C.P., Senior Lecturer in Medicine; H. J. Fisher, M.B., B.Ch., F.R.C.S.Ed., M.R.C.O.G., Senior Lecturer in Obstetrics and Gynaecology; W. R. L. James, M.B., B.Ch., Senior Lecturer in Forensic Medicine.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Watson.—On September 12, 1954, to Moira (formerly Keatinge), wife of John Smyly Watson, M.D., M.R.C.P., of 22, Cambalt Road, Putney, London, S.W., a son—William John.

DEATHS

Baldry.—On October 19, 1954, at Crathie, Langdon Lane, Galmpton, near Brixham, Devon, Charles Victor Nelson Baldry, M.R.C.S., L.R.C.P., aged 66.

Chalmers.—On October 21, 1954, at 2, Sainfoin Road, Upper Tooting, London, S.W., Robert Miller Chalmers, M.B., Ch.B., aged 53.

Chapman.—On October 20, 1954, at Helmwood, Windermere, William Daniel Chapman, M.B., B.Chir, aged 83.

McClosky.—On October 20, 1954, at Ealing, London, W., Arthur James McClosky, M.D., late of Malaya, aged 88.

Payne.—On October 18, 1954, Ernest Le Fèvre Payne, M.R.C.S., L.R.C.P., of Bramdean, Kennington, Kent, late of Brunswick House, Kew, Surrey, aged 84.

Warner.—On October 20, 1954, Howard Francis Warner, M.B., B.S., late of Fakenham, Norfolk, and Beccles, Suffolk, aged 73.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Choice of Stethoscope

Q.—*For what purposes are bell and diaphragm stethoscopes respectively best suited? Is a combination instrument advisable?*

A.—The bell stethoscope is particularly suitable for the auscultation of low-pitched sounds and murmurs. It is, however, relatively inefficient for the auscultation of high-pitched sounds, particularly almost inaudible high-pitched aortic diastolic murmurs. The membrane of the diaphragm chest-piece is rigid and has a relatively high frequency-response of its own; thus it tends to be relatively unresponsive to sounds of low frequency which are filtered out. It therefore produces an apparent intensification of high-pitched sounds. In pulmonary physical signs the diaphragm chest-piece is of course specially suitable for the recognition of high-pitched tubular breathing and high-pitched fine crepitations. The old wooden stethoscope had certain advantages in the auscultation of high-pitched sounds and murmurs, but its use has now largely gone out of fashion. On occasions the direct application of the ear to the front of the chest may pick up high-pitched aortic diastolic murmurs which are otherwise hardly audible. The last method of auscultation, however, is not always suitable. A combination stethoscope with a switch to bell and diaphragm alternatives is certainly a good investment. An excellent discussion of the problem was published by M. B. Rappaport and H. B. Sprague.[1]

REFERENCE

[1] *Amer. Heart J.*, 1941, **21**, 257.

Danger of Thiourea on Oranges

Q.—*There have been recent reports of the harmful properties of thiourea on citrus fruits. Can you give me some information about this?*

A.—Thiourea was introduced about 12 years ago for the treatment of thyrotoxicosis. Doses of 1–2 g. daily were prescribed. These doses had no obvious toxic effects on normal people when given over short periods. However, the use of thiourea for thyrotoxicosis was abandoned in favour of more active thiouracil compounds, and also because it was unpleasant to take and imparted an odour to the breath. The median lethal dose for dogs and rabbits is around 10 g. per kilo, but rats vary considerably in their sensitivity to thiourea and substituted thioureas. There is considerable variation both in the sensitivity of different species and even between different strains of the same species. One thiourea (alpha naphthyl thiourea, "antu") is used commercially as a rat poison because of its selectivity against them.

In the laboratories of the Food and Drug Administration in Washington some experiments were done demonstrating the sensitivity of rats to thiourea in orange juice. It was presumably on the basis of these that the use of thiourea as a fungicide on oranges was banned. Claims were even made that by this prompt action danger to the lives and health of Americans was averted. Only by ignoring the results of much work on experimental animals and direct human experience is it possible to arrive at a conclusion that the particular observations on rats given orange juice and thiourea gave a true picture of the likely hazards to man.

Local Instillation of Antihistamines in Hay-fever

Q.—*What is the value of antihistamines for the relief of hay-fever when applied locally by instillation into the nose?*

A.—The use of antihistamine solutions applied locally in the nose for hay-fever or other nasal allergy is very questionable. These substances are best used in capsule form by mouth, since nasal instillation has been shown to promote various harmful phenomena in a comparatively short time—such as local sensitivity reactions, "dose tolerance," "rebound" vasodilatation, and actual liberation of histamine during the primary vasoconstrictor action, which may be associated with the "rebound" phenomenon. In addition, the local analgesic side-effects on the nasal mucosa make evaluation of the true action and value of these solutions more difficult. The worst offender is "antistin-privine" solution. With this, sensitivity to the "antistin" and "privine," more often the latter, together with "dose tolerance" and severe "rebound" phenomena, are especially liable to occur.

A recent paper by Schaffer and Seidmon[1] claims partial or complete alleviation of symptoms in 60–85% of allergic patients by nasal instillation of "trimeton" (prophenpyridamine maleate) with complete absence of the harmful effects described above over periods of three to nine months' continuous use. We have no experience of these substances as yet.

REFERENCE

[1] *Ann. Allergy*, 1952, **10**, 194.

Treatment of Mumps Orchitis

Q.—*What are the indications for oestrogen therapy and surgical intervention in the management of mumps orchitis? What dosage of oestrogen is recommended, and are there any contraindications to the use of oestrogens in children?*

A.—There are conflicting reports on the value of oestrogens in the prevention of mumps orchitis, most recent studies tending to deny their value. However, in treatment of the orchitis once it has occurred oestrogens may be of some help. Although I have seen orchitis develop on treated patients, the complication was less marked than expected. I give all my male adolescent and adult patients diethylstilboestrol, in doses of 2–5 mg. twice daily, for about a week after the onset of mumps. Although orchitis has been recorded in children, it is so extremely rare that the use of oestrogens is not justified.

There is claimed to be justification for surgical intervention (a very small incision in the tunica albuginea) (1) where there is great swelling and severe pain; (2) where both testes are involved. It is believed that if atrophy is to be prevented the decision to operate should not be delayed longer than 36 hours from the onset of severe symptoms.

Tzanck's Hooks

Q.—*What are Tzanck's hooks?*

A.—Tzanck described two types of "hooks" (*crochets*) observed during treatment for syphilis; one was on the temperature chart following penicillin therapy, the other was related to the slight rise in titre of serological reactions during arsenical treatment in the primary stage of syphilis. In the opinion of the writer the rise in temperature after the first penicillin injection is simply the Herxheimer reaction. Tzanck and his collaborators[1] stated that after eight hours (provided the temperature is taken hourly) a rise in temperature is to be observed. This had previously been reported by many syphilologists. The transient serological rise in titre (*signe de crochet*) was noted during intravenous arsenical therapy of primary syphilis.[2] Tests had to be carried out twice weekly and the slight rise was observable on or about the twentieth day.

REFERENCES

[1] *Bull. Soc. franç. Derm. Syph.*, 1947, **54**, 67.
[2] Ibid., 1923, **30**, 227.

Biochemical Tests for Cancer

Q.—*For what types of cancer are there biochemical tests which help in diagnosis and prognosis?*

A.—Apart from certain endocrine tumours there are no specific biochemical tests for cancer either in general or in particular. Certain tumours such as the chorion epithelioma and tumours of the testes are associated with alterations

in the rate of excretion of the gonadotropic hormones. Again, certain virilizing tumours of the suprarenal gland are associated with excretion in the urine of characteristic steroidal substances. In cancer of the prostate investigation of the acid serum phosphatase content will assist in both the diagnosis and the treatment.

Dobriner has claimed that a study of the pattern of urinary steroidal substances will indicate the malignant nature of a growth, but recent work has tended to indicate that the changes in the pattern he describes are probably not specific for cancer.

Broken Dentures

Q.—*As a ship surgeon I am often confronted with broken plastic dentures. Is there any simple way of repairing these, temporarily or permanently?*

A.—The fractured denture is prepared as for a normal repair. A self-curing resin (such as "simplex" self-curing resin, made by Dental Fillings Ltd.) is then inserted into the prepared area according to instructions enclosed with the material.

Oiling of Bedclothes in Asthma

Q.—*Is the oiling of bedclothes and floors, with the object of reducing the general dustiness of the atmosphere, a useful measure in the management of asthma?*

A.—The oiling of bedclothes and floors will reduce "house dust" in the atmosphere, but whether the cost and inconvenience make it a worth-while procedure is doubtful. To be efficient all fabrics in the room would have to be done, and the procedure is not generally advocated in the current literature. Emphasis is laid more on the light furnishing of the bedroom, the use of non-allergenic materials as far as possible (rubber beds and pillows), the frequent laundering of cotton and woollen blankets, and daily dusting of the bedroom with a damp cloth, together, where necessary, with house-dust hyposensitization.

T.A.B. after Encephalitis

Q.—*Has T.A.B. vaccine any place in the treatment of the late effects of encephalitis? A patient whose child had the disease three years ago has produced a cutting from an American newspaper claiming startling improvement.*

A.—T.A.B. vaccine has been used in the treatment of various chronic neurological disorders, in particular disseminated sclerosis, with capricious and usually disappointing results. I do not know of any patients suffering from the late effects of encephalitis treated with this vaccine, but it is unlikely that they would benefit from such treatment. A further point is that neurological disorders, including acute encephalomyelitis, may occasionally follow the prophylactic use of T.A.B. vaccine.

Loss of Memory for Names

Q.—*Why is it that some elderly people lose their ability to remember names while retaining that for events?*

A.—If there is a tendency to forget, the things that are more easily remembered are those bound up with emotion, or those, to use common parlance, that have a lot to them and involve a number of particulars. A remembered event is usually a complex of happenings, structurally bound together, so that if memory can catch on to any part of the complex it may be able to bring the whole into consciousness; inessential details may, of course, still be forgotten, but the more meaningful the matter the more easily it is recalled. Events which a person is called on to remember are nearly always significant ones, and involve past affective participation. This is very often not the case when the recall of a mere name is demanded.

Furthermore, in presenile, senile, and arteriosclerotic deterioration there is often a degree of focal incidence in the brain, some parts being more affected than others. A part which is often preferentially affected is the centre controlling higher speech functions. A subclinical degree of nominal aphasia may be observable in a specific disability to recall names.

Normal E.S.R. with Active Tuberculosis

Q.—*Is it possible to suffer from active tuberculosis of the lungs with a normal E.S.R.?*

A.—Yes. This is common. A raised E.S.R. is suggestive of activity, but a normal E.S.R. does not exclude activity.

NOTES AND COMMENTS

Ankylosing Spondylitis.—Squadron Leaders J. L. MILLIGAN and C. B. WYNN PARRY (R.A.F., Chessington, Surrey) write: We would like to comment on some aspects of the answers given by your expert on ankylosing spondylitis ("Any Questions?" October 9, p. 885). The statement that spondylitis is essentially a disease of the spine and limb girdles and that peripheral joint involvement occurs at a later stage has not been found true in our experience. In 25% of our cases the first manifestation of the disease takes the form of a peripheral joint arthritis, the knee and ankle being most commonly involved. We have also seen cases in which lumbar and thoracic joints showed advanced arthritis with little or no change in the sacro-iliac joints, and in most cases in our experience changes in the apophyseal joints run parallel with the sacro-iliac changes and do not occur much later. With regard to the sedimentation rate, we have found this to be more often normal than not, in the first two years of the disease, even in an active phase. This was well brought out in Parish's series.[1] We feel that if the diagnosis of spondylitis is to be made solely on the objective evidence of *x*-ray and sedimentation changes the disease will not be diagnosed for at least two years in most cases. Parish's aphorism seems to present the salient feature in all cases of spondylitis. "The patient usually has to steer a careful course between insufficient exercise which makes him stiff and excessive exercise which gives him pain." It seems to us vital to make the diagnosis as early as possible, and, even if the radiotherapists are not willing to give deep *x*-ray therapy without confirmatory *x*-rays and sedimentation changes, a programme of full mobilizing exercises including breathing exercises should be instituted immediately, and the patient regarded as having spondylitis until prolonged follow-up proves the case one way or the other.

OUR EXPERT writes: If the term ankylosing spondylitis is taken to include all forms of arthritis in which there is some spinal involvement there will naturally be many cases with widespread involvement of the peripheral points.

REFERENCE

1 Parish, J. G. (1953). *Ann. phys. Med.*, 1, 275.

Correction.—We regret that in our issue for November 6 (p. 1108) in Dr. L. G. Scott's letter on "Encephalitis after Yellow Fever Vaccination" we printed the date of the patient's admission to hospital as September 9, whereas it should have been September 30.

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